amateur radio

VOL. 45, No. 2 FEBRUARY, 1977

CONTENTS

TECHNICAL

Newcomers Notebook	10
Radio Teletype — Part 2	6
Technical Correspondence	14
Why Radio Frequency Clipping	8

GENERAL

AR Awards	25
Commonwealth Contest 1977	19
New Novice Operator	16
Technical Tips — CB Style	16

DEPARTMENTS

Around the Trade	19
Awards Column	18
Contests	18
Hamads	26
IARU News	19
Intruder Watch	25
LARA	18
Letters to the Editor	20
QSP	3, 4, 22
Repeaters	19
Silent Keys	26
VHF-UHF — an expanding world	24
WIANEWS	4
WICEN	25

COVER PHOTO

WIA Executive Member Surgeon Rear Admiral Jim Lloyd VK3CDR at his compact station (see page 5).

Photo by Reg Gouge

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

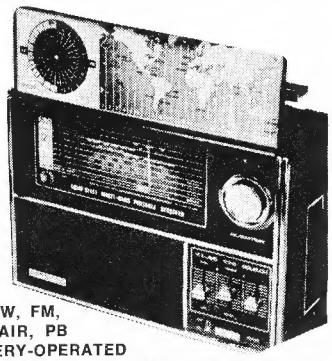
HAM RADIO SUPPLIERS

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286

Our Disposals Store at 104 HIGHETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 9.00 a.m. to 5.00 p.m., and on Saturdays to midday.

SOLID STATE 19 TRANSISTOR MULTI-BAND RADIO — 9 RANGES



AM, SW, FM, VHF, AIR, PB
BATTERY-OPERATED
COLOUR CODED 9 BAND DIAL

1. AM 535 to 1600 kHz. 2. Marine 1-5 to 4 MHz. 3 & 4. Combined SW 4 to 12 MHz. 5. 30 to 50 MHz. 6. 88 to 108 MHz. 7, 8 & 9. Combined VHF Aircraft 145 MHz-174 MHz incorporating weather band.
Slider control, Dial light, Fine tuning control, Flip-up Time Zone map, Telescope antennas complete with batteries.

SPECIAL PRICE **$59** Post Pack $3.00

KARPACK VOLTAGE ADAPTOR

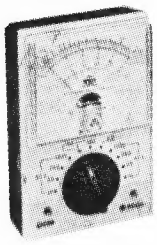
Operates from car cigarette lighter socket. 12V neg. earth cars only. Output 6V, 7.5V and 9V (switched) to 300 mA max.
$6.90 — Post free

RADIO VALVES

OA2	$2.10	6BQ5	$1.50
IB3	$1.60	6BU8	$2.00
IR5	$2.10	6BU7	$3.20
IS2	$1.30	6BY7	$2.00
IS5	$1.70	6BX6	$1.50
IT4	$1.50	6B26	$1.70
IX2B	$1.70	6CB6	$1.50
3S4	$2.20	6CG7	$1.20
3V4	$2.50	6CG8	$2.10
6AL3	$1.30	6CQ8	$1.50
6AN7A	$2.30	6CS6	$1.70
6AN8	$3.10	6CW5	$1.30
6AQ5	$1.50	6CW7	$2.80
6AU6	$1.20	6EA8	$1.50
6AV6	$1.50	6EH7	$1.20
6AW8	$1.50	6EM5	$1.70
6BE6	$1.70	6ES8	$1.70
6BH5	$2.10	6DX8	$1.50
6BL8	$1.20	6GH8	$2.80
6BM8	$1.50	12AV6	$1.70
6GV8	$1.50	12AX7	$1.20
6GW8	$1.50	12AY7	$3.30
EF86	$2.30	12AT7	$1.00
6H98	$1.60	6CM5	$1.90
6N8	$1.90	5Y3	$1.70
6S2	$1.80	6AR7 = EBF35	$3.00
6U8	$1.50	6L69	$3.00
6U9	$2.00	6AV4	$1.80
6V4	$1.20	6146	$8.90
6V9	$3.20	807	$3.00
6X4	$1.20		
6X9	$2.00		
6Y9	$2.10		
9A8	$1.50		
12AU7A	$1.20		

Hundreds of others in stock. Please send wanted list.

POCKET MULTIMETER SPECIAL



MODEL C1000M MULTIMETER

Compact, handy and versatile, the C1000M is the ideal low cost pocket meter, Mirror Scale. **Specifications:** 1,000 Ohm/Volc DC; 1,000 Ohm/Volt AC; DC volts — 10; 50; 250; 1,000; AC volts — 10; 50; 250; 1,000; DC amps — 1 mA; 100 mA; Ohms — 150 KΩ; Centre scale — 3 KΩ; Decibel — 10 dB to 22 dB; Dimensions — 3-1/2" x 2-3/8" x 1-1/8" 90 x 60 x 30 mm.

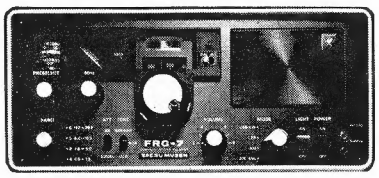
$9.75
POST FREE

CT-500 — $24.90 — Postage $1.30

Popular, medium-size, mirror scale. Overload-protected.
AC/V: 10V, 50V, 250V, 500V, 1000V, (10,000 ohm/V).
DC/V: 2.5V, 10V, 50V, 250V, 500V, 5000V (20,000 ohm/V).
DC/A: 50 uA, 5 mA, 50 mA, 500 mA.
OHM: 12k ohm, 120 k ohm, 1.2M ohm, 12M ohm.
dB: 20 dB to +62 dB.
Approx Size: 5½" x 3 5/8" x 1P". **P&P 50c**

YAESU FRG-7

THE RADIO FOR WORLD-WIDE LISTENING AT ITS BEST — 0.5-29.9 MHz COVERAGE SYNTHESIZED COMMUNICATION RECEIVER



The model FRG-7 is a precision built high performance communication receiver designed to cover the band from 0.5-29.9 MHz. Its state of the art technology offers an unprecedented level of versatility. The Wadley Loop System (drift cancellation circuit) coupled with a triple conversion super heterodyne system guarantees an extremely high sensitivity and excellent stability. It provides complete satisfaction to amateurs as well as BCLs with superb performance and many features such as RF attenuator, selectable tone, and automatic noise suppression circuit.

URGENT!
DISPOSALS EQUIPMENT CLEARANCE

We must make room at our BULK STORE at 104 HIGHETT ST., RICHMOND to accommodate new stocks of equipment. You are invited to call in and inspect the large variety of ex-Government disposals, test gear, oscilloscopes, valves etc. on view. No reasonable offers refused as our need for space is urgent.

Open 9-5 Mon.-Fri. and 9-12 Sat.
Telephone 42 8136

BRIDGE ROAD, RICHMOND STORE SPECIALS

27 MHz BASE LOADED MOBILE ANTENNAS, suitable for roof, boot or hood mounting. Approx. 30 in. overall length and supplied with 52 ohm coax and PL259 plug fitted. **$25 each. Pack and Post $3.**

BRAND NEW THORN TV TUNERS. Model ENR-5758. Using 1 x 6GK5 and 1 x 6GS7 valves. **$2 each.. Pack and Post $1.**

B.S.R. C129R2 STEREO RECORD CHANGERS. 3 speed (33, 45, 78 r.p.m.) record arm cueing lever and complete with ceramic cartridge. **$27.50. Pack and Post $5.50.**

NEW 500K LINEAR SLIDE POTS manufactured by Noble. 75 x 10 x 10 mm with 30 mm shaft. Give away at **10 for $1, plus 75c post.**

MAGNAVOX 5 in. x 3 in. SPEAKERS. Model 53T, impedance 8 ohm. **$2.50 each. Pack and Post 75c.**

SPLIT STATOR CAPACITORS with screwdriver slot drive, available in 9, 17 or 25 PF. Reduced to **$2 each. Pack and Post 50c.**

"ARISTAR" PUSH BUTTON CAR RADIOS. Universal mount negative or positive earth car radio complete with speaker and lock down antenna. 5 watts audio output, 12V DC operation. **$28.90. Pack and Post $3.50.**

VALVE SPECIAL

6BM8. Brand New — Unboxed.
10 for $8

6GV8. Brand New — Unboxed.

10 for $10
Pack and Post $1.50

TRANSFORMER SPECIAL

TYPE 5094. Primary 240V, Secondary 123 — 130 — 137V at 180 mA, 37 — 40.5 — 44V at 60 mA, 5V at 3 amps, 2 x 6.3V at 3 amps.

$10 each, $3 Post

TYPE 6221. Primary 240V, Secondary 520V at 200 mA.

$8 Each, $3 Post

ROLA SPEAKER TRANSFORMERS

2500 to 3.5 ohms — 500 to 3.5 ohms — 6200 to 15 ohms.

$2 each, 75c Pack and Post

MAIL ORDERS WELCOMED. Please allow pack and post on items listed on this page. If further information required send a stamped SAE for immediate reply from the above address. Larger items can be sent F.O.B. Due to circumstances beyond our control, prices quoted in this advertisement are subject to alteration without notice. New equipment available at our Bridge Road Store.

amateur radio

Published monthly as its official journal by the Wireless Institute of Australia, founded 1910.

FEBRUARY 1977
Vol. 45, No. 2

PRICE: 90 CENTS
(Sent free and post paid to all members)

Registered Office:
2/517 Toorak Road,
Toorak, Victoria, 3142.

Registered at the G.P.O. Melbourne for transmission by Post as a Periodical — Category "B".

EDITOR:
BRUCE BATHOLS* VK3UV

ASSISTANT EDITOR:
RON COOK* VK3AFW

TECHNICAL EDITORS:
BILL RICE* VK3ABP
GIL SONES* VK3AUI
KEN PALLISER VK3GJ

CONTRIBUTING EDITORS:
BRIAN AUSTIN VK5CA
RODNEY CHAMPNESS* VK3UG
DAVID DOWN VK5HP
RON FISHER* VK3OM
DAVID HULL VK3ZDH
ERIC JAMIESON VK5LP
KEN JEWELL VK3ZNJ
PETER MILL VK3ZPP
KEVIN PHILLIPS VK3AUQ
LEN POYNTER* VK3ZGP

DRAFTING:
ALL DISTRICTS DRAUGHTING SERVICE
KEN GILLESPIE* VK3GK

PHOTOGRAPHER:
REG GOUGE —

BUSINESS MANAGER:
PETER DODD VK3CIF

EDITORIAL CONSULTANT:
BILL ROPER VK3ARZ

ADVERTISING REPRESENTATIVE:
TOM COOK

***Member of Publications Committee**

Enquiries and material to:
The Editor,
PO Box 2611W, GPO Melb., 3001

Copy is required by the **third of each month.** Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail.
The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

Advertising:
Advertising material should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **25th of the second month preceding publication. Phone: (03) 24 8652.**
Hamads should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **3rd of the month preceding publication.**

Trade Practices Act:
It is impossible for us to ensure that advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are complied with strictly.

Printers: EQUITY PRESS PTY. LTD.
50-52 Islington Street, Collingwood, 3066
Tel.: 41-5054, 41-5055

QSP THIRD PARTY TRAFFIC

At this time of the year our thoughts turn to the John Moyle Memorial Field Day. A contest which, over the years, has enabled amateurs throughout Australia to test their ability to operate radio equipment in remote locations completely independent of commercial power sources.

This ability of radio amateurs to maintain communications under extremely adverse conditions, carrying out makeshift repairs where necessary, is the attribute which makes WICEN so versatile.

Ever since the early days of radio, radio amateurs have rendered assistance during emergencies aided in no small way by their ubiquitous distribution and unique ability.

The WIA, through the Divisions, has close liaison with individual State emergency organisations and more recently, through the Federal WICEN Co-ordinator, with the NDO.

The fact that Australian radio amateurs are prohibited from communications on behalf of third parties has been a complication in the operation of WICEN nets. Although permission has been readily granted for special training exercises it still means very rigid scheduling of them. Also, in many minor emergencies the situation could have been resolved with a minimum of "red tape".

The ITU, although making a general prohibition of international amateur third party traffic, realises that some Administrations favour third party privileges for their amateur service and make provision for agreements to be concluded between the administrations concerned to permit third party traffic.

It is therefore apparent that the simple matter of allowing Australian radio amateurs third party traffic concessions could ease a large number of problems in the utilisation of radio amateurs in emergencies and also in their training so necessary for efficiency.

Members will therefore be aware that the question of third party traffic is one that is still in mind.

(Sgd.) D. A. WARDLAW, VK3ADW,
Federal President. ■

QSP

WHY NINE PLUS?

The editorial by W1DTY in Ham Radio Nov '76 looks very famliar — ". . . Interference on the amateur bands is something that most of us have learned to live with, at least to a certain extent, but in recent months I have noticed an increasing number of bad operating practices cropping up on our bands. Apparently other amateurs have been troubled, too, because I have received a number of letters on the subject. None of these practices is new, but they're more offensive because the bands are much more crowded than they used to be. Deliberate interference, tuning up on net frequencies, playing music, calling CQ without listening first, offensive language, incorrect identification (or no identification at all), using a kilowatt when 100 watts is adequate, talking crosstown on 20 metres instead of using VHF-FM — the list could go on and on."

He goes on to enjoin good operating practices and makes the point that whilst net operations are not for everyone, at least those engaged in the nets are not elsewhere on the bands creating more QRM. And why, he asks, the big penchant for S9 signal reports (by unnecessary use of linears) when perfectly adequate QSOs can be maintained with S6 or 7?

INTERFERENCE POSSIBILITIES

"A French manufacturer is selling and installing equipment known as 'Syeldis". This is a radio-navigation system intended for use on trawlers. Centred on 438.05 MHz, the system has a bandwidth of ± 2.5 MHz, the mode is FM and the power is 100 W. Syeldis uses three beacons and the interference created extends over a considerable distance..' "Radio Communication," Dec. '76.

NOTES FROM IARU

There are now 152 member countries of the ITU. There is an IARU affiliated amateur radio society in 83 of those countries; 9 are in Region 3 and 24 in Region 2. This means there are 69 countries which do not possess an amateur radio society as a member of IARU. Numbered among these countries in Region 3 are Afghanistan (amateur radio banned), Bangladesh, China (no amateur radio), Fiji, Indonesia (active society; preparing to join IARU), Iran, Khmer Republic, Korea North, Laos, Maldives, Nepal, Nauru, PNG (society under formation) and Vietnam. There are IARU societies in Hong Kong and W. Samoa but neither country is an ITU member. The President of Bolivia is an amateur, call sign CP1CL and also their Minister of Transportation, CP1HF. Amateurs in Bolivia can send QSL cards at one-half the regular postage rate. Region 2 News Nov '76.

WWV AND WWVH CLOSE-DOWN

As from February 1 1977 the National Bureau of Standards (USA) will discontinue transmissions on 2.5, 20 and 25 MHz from WWV, Colorado, and 20 MHz from WWVH, Hawaii. WWV and WWVH transmissions will continue as at present on 5, 10 and 15 MHz and also on 2.5 MHz from WWVH only.

WWV has operated for over 50 years and WWVH for over 25 years, however rising power bills and salary costs have forced the services to be reduced. In 1974 the power bill alone for WWVH was $100,000. Within the next decade time and frequency dissemination via sattelites may supersede WWV and WWVH entirely.

IMPORTANT NOTICE TO ALL CLUB SECRETARIES

The 1977 Amateur Call Book is currently on the drawing board and the editorial staff require a complete list of all radio clubs, etc., for inclusion therein.

We earnestly request that club secretaries send details NOW, as soon as you have read this, to the Editor, Amateur Radio, P.O. Box 2611W, G.P.O., Melbourne 3001.

The following information is required:—
Meeting times and days.
Address of club.
Secretary's name and phone No.
Club call sign (if any).

Details of times, etc., for any educational information.

Miscellaneous general items which is considered useful for publication.

Please note that it is hoped to publish the Call Book during May 1977, therefore all material for inclusion MUST be in the Editor's hands NO LATER THAN 31st March 1977.

Material received after that date WILL NOT be included in the 1977 Call Book.
VK3UV Editor. ■

WIANEWS

Reminders to the RFMD on a range of outstanding matters elicited a telex reply during December referenced RB4/11/35.

RTTY

The Department agrees to the use of the eight unit (start-stop) American Standard Code for Information Interchange (ASCII) and such other international codes as are recognised by the ITU. Further submissions from the Institute are required to support the request to increase the maximum frequency shift from 850 Hz to 1650 Hz.

Agreement in principle was given to the conditions relating to the method of identification when using RTTY but the Department themselves will be re-writing paragraph 112 of the Handbook. This means that on bands below 52 MHz identification can be in the mode in use or by morse code or telephony according to the type of mode actually used (reference should be made to your Divisional Council if any doubts exist about the correct mode of ident).

GHz BANDS

The Department does not envisage the allocation for any specific use prior to WARC 79 of any of the bands requested for use by the amateur (and amateur satellite) service above 24 GHz. However consideration will be given to applications from individual amateurs wishing to conduct experiments in these bands. The bands concerned are 40-50 GHz, 71-76, 165-170 (now amended to read 155-160 because of moisture vapour absorption characteristics), 216-220, 240-250 and all above 275 GHz.

ATV REPEATERS

Approval in principle was given for ATV repeaters with input frequencies in the 70 cm band and output frequencies in the 576-585 MHz band subject to no re-transmission of any other signals.

A wide range of other items either were not approved or were not specifically mentioned except the new call book contract — please see below.

The requests for (a) 4 amateur examinations (all classes) per annum; (b) use of CW by limited licensees in all bands above 144 MHz on passing a 5 w.p.m. exam and (c) "Parity" in maximum power levels for A1 vis-a-vis A3J stations were not approved.

Similarly turned down were various requests to amend the conditions applicable to amateur repeaters and the submission that identification periods for amateur stations be increased from 5 minute to 10 minute intervals. The latter was refused for regulatory purposes. Also refused at the present time were requests for extensions to the 80, 40 and 6 metre bands because, they say, the WARC 79 outcome must be awaited. Present privileges granted for WIA broadcasts also would not be altered.

Other matters which will require further discussions with Central Office are (a) the acceptance procedures for activating amateur stations for emergencies as set out in paragraph 94 of the Handbook, and (b) the apparent refusal to licence beacons, repeat beacons, in bands below 52 MHz. The WIA band plan for the 430 to 440 MHz portion of the 70 cm band has been noted (including repeater frequency and simplex channels, etc.) and any amendments thereto will require submission.

Dialogue with the Department will continue in a variety of items not included in their telex such as numerous examination matters, various repeater considerations, interference procedures, etc.

1977 CALL BOOK

Early in January a letter was received from the Australian Government Publishing Service enclosing a contract for the 10 year period from 1977 for publishing the WIA Call Book. Many of the conditions are a re-hash of those imposed in the 1970 contract but a number will require closer examination in relation to present day conditions and procedures. If this contract is signed the first call book must be published not later than 1st May, 1977. Copyright of the contents of the entire book will vest in the Government. The whole question is currently under consideration.

POSTAL MOTIONS

Both the postal motions listed in WIANEWS of January 77 AR have been passed by the Federal Council.

EXAMINATIONS SYLLABUSES

The Federal Education Co-ordinator had produced a syllabus for the Novice theory examination. This is currently the subject of intensive study in many locations and it is hoped that a finally-agreed draft can be prepared for submission to Central Office in the near future. Many of those concerned with its preparation have urged caution and have suggested a good syllabus is better than one hastily prepared. A draft AOCP level theory syllabus has also been prepared and should be in circulation by the time this appears in AR. Any comments of a general nature would be welcomed.

The Federal President, Dr. D. A. Wardlaw, VK3ADW is scheduled to visit Sydney from the evening of February 18th and will be attending the Central Coast Field Day activities in Gosford before returning to Melbourne on Sunday evening the 20th.

A reminder. Agenda Items for the 1977 Federal Convention are due; correspond with your Division. The Convention is due to be held in Melbourne from 23rd to 25th April inclusive. ■

QSP—continued

MOBILE OPERATION — IMPORTANT ADVICE

Because of the current "CB" activity on 27 MHz, the State Police have been empowered, by arrangement with the District Radio Inspector and Telecom, to stop and search any vehicle "suspected" of carrying or operating illegal 27 MHz equipment.

All amateurs operating mobile are therefore advised to carry with them their licence or a photostat copy for proof of the legality of the equipment installed in their vehicle. It is also required that the licence renewal certificate and a log book be carried.

It is also advisable that if the amateur himself is not using the vehicle, all equipment should be removed so that the XYL on her shopping trip is not booked for illegally being in possession of transmitting equipment.

From Illawarra ARS Newsletter December 1976.

GHz BANDS

Reporting on the IARU R1 VHF Managers' meeting in Amsterdam last October, G3RPE, in his Microwaves column in January '77 Radio Communication, said — "It was also suggested that deliberate efforts should be made to catalyse at least some activity at frequencies above 40 GHz since this was now the pioneering part of the radio spectrum, and any activity by amateurs in this region would be expected to have a great impact." In the UK microwave records it was observed that 521 km was the record on 10 GHz and 154 km on 24 GHz. A world record on 3.4 GHz was recorded as 383 km between two ZL stations in 1975.

LIGHTNING RISKS

In his T.T. column in January '77 Radio Communication, Pat Hawker devotes two columns to techniques to minimise the effects of lightning strikes on both persons and equipment. The simple precaution for people caught outdoors indicate that a squatting position away from other objects (and people) reduces the risk of being struck. In regard to aerials and lines it seems the best policy first to shunt, then to isolate. In other words, having made the shunt paths to ground as attractive as possible, the route into the equipment should be made unattractive by adding isolation, in the form of impedance. For people the best shelters appear to be in an all-metal vehicle or in a building, but out in a boat proper bonding of the mast and rigging to a metal keel seems the best preventive. It is wiser to get wet than hold an umbrella upright.

OCEAN MISHAP

From the "Amver Bulletin" of the US Coastguard June/July '76 kindly forwarded by Dave Jeanes VK2BSJ/MM on the m.v. Darwin Trader, comes a story of the sloop "Sorcery" en route from Tokyo to Los Angeles with a crew of 11 persons. The 61 foot sloop was caught in a heavy storm on 8th May about 1000 miles SW of Kodiak, Alaska, and rolled over in raging seas losing her mast, lifeboat and rudder. The only communications still operating was a small amateur radio station aboard, which, with the assistance of a piece of wire running across the deck, enabled communications to be opened with radio amateurs in San Diego, Midway and Hawaii. The crew were rescued the following day on the diversion of the CG cutter Mellon after being pinpointed by a rescue aircraft from Kodiak dropping supplies and the m.v. Camara standing by after the sighting. Dave also mentioned meeting Al Fox VP2LOX/MM3 on his yacht "Foxtrot" during a call at Darwin in October. Al and his XYL have already circumnavigated the world once and this was their second time round en route to USA via Bali, Singapore and Cape of Good Hope. ■

SEE FRONT COVER PHOTO

PROFILE OF VK3CDR, SURGEON REAR-ADMIRAL JIM LLOYD, QHS

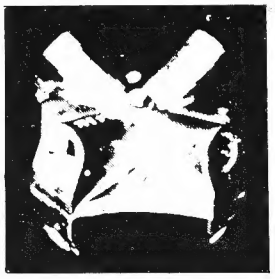
Jim was first licensed as G3DKI in 1948 exchanging this for VK3AST in 1952 and VK2BST in 1966. In 1969 he was issued with the first "interstate" call sign — VK3CDR.

Two metre FM operators will have heard VK3CDR operating portable, mobile or marine-mobile. When time permits Jim also appears on 3.5, 7 and 14 MHz CW or SSB using home-brew equipment.

Amater Radio is not Jim's only hobby. Photography, sailing, home-brewing (the real stuff), wine-making and bee-keeping all help to fill Jim's leisure hours. Not that there are many of those as since joining the RSGB in 1946 and the WIA in 1952 he has served on the VK3 Divisional Council as Federal Councillor and State President and is currently a member of the Federal Executive.

On the professional side Jim commenced his career as a medical officer in the RAN, specialising in Nuclear Defence and radiological protection. His current posting is Director-General of Naval Health Services. ■

ANTENNA PARTS, KITS



QUAD HUB $35.00 plus Postage (3 kg) mass.

QUAD KIT $135.00. Freight forward.

Consisting of: Hub: 12 ft. solid F/G. Spreaders: Aluminium Extenders. Ferrules. Adaptors: 350 ft. 0.064 Hard Drawn Copper wire. Nylon line and insulators.

MOBILE ANTENNA PARTS:

6 ft. solid F/G blanks, ½-¼ inch **$4.50 ea.**

Solid brass butt fitting, ½ in. whit. or 3/8 in. UNF thread **$3.00**

Brass tip chuck **50c**

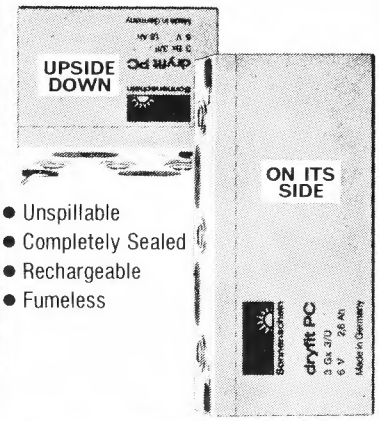
S. T. CLARK

P.O. BOX 45, ROSANNA

VIC., 3084 Ph.: 45-3002

R.H. Cunningham Pty. Ltd.

This lead acid battery can be fitted in any position . . .



- Unspillable
- Completely Sealed
- Rechargeable
- Fumeless

Sonnenschein batteries are of the lead-acid type, ideal for all kinds of portable electronic equipment requiring 2, 6 or 12 volts at .9 to 7 amp hours capacity. Send for free comprehensive Technical Manual.

Sonnenschein

Sonnenschein dryfit PC BATTERIES For the man who has a battery problem.

Available from Wholesalers or the Australian Agents

R.H. Cunningham Pty. Ltd.

VIC.: 493-499 Victoria St., West Melbourne, 3003 Ph.: 329 9633
N.S.W.: 4-8 Waters Rd., Neutral Bay, 2089. Ph.: 909 2388
W.A.: 256 Stirling St., Perth, 6000. Ph.: 28 3655
QLD.: L. E. BOUGHEN & CO., 30 Grimes St., Auchenflower, 4066. Ph.: 370 8097
S.A.: Werner Electronic Industries Pty. Ltd., Unit 25, 6-8 Gray St., Kilkenny, 5009. Ph.: 268 2801.

Telex: Melbourne, 31447 Sydney, 21707. Brisbane, 41500. Perth, 93244.

10.7 MHz CRYSTAL FILTERS FOR FM

SYNONYMOUS FOR QUALITY AND ADVANCED TECHNOLOGY

KVG

MATCHING CRYSTAL DISCRIMINATORS

NBFM	XD107-01
WBFM	XD107-02
(1-9)	$22.10 each

Oscillator Crystals 50 kHz through 150 MHz available to order. Parallel resonant (30 pF) to 20 MHz, series resonant above 20 MHz. Write for quotation to your requirements (include mechanical size & frequency).

EXPORT ENQUIRIES WELCOME

Filter Type	XF107-A	XF107-B	XF107-C	XF107-D	XF107-E	XF107-SO4	XF102
Application	NBFM	NBFM	WBFM	WBFM	WBFM	NBFM	NBFM
Number of Filter Crystals	8	8	8	8	8	4	2
Bandwidth	12.0 kHz	15.0 kHz	30.0 kHz	36.0 kHz	40.0 kHz	14.0 kHz	14.0 kHz
Pass Band Ripple	← ≤ 2 dB →					≤ 1 dB	≤ 2 dB
Insertion Loss	≤ 3.5 dB	≤ 3.5 dB	≤ 4.5 dB	≤ 4.5 dB	≤ 4.5 dB	≤ 3 dB	≤ 1.5 dB
Input/Output Termination Z_t	820 Ω	910 Ω	2000 Ω	2700 Ω	3000 Ω	910 Ω	2500 Ω
Input/Output Termination C_t	25 pF	25 pF	25 pF	25 pF	25 pF	35 pF	–
Shape Factor	(70 dB) 2.4	(70 dB) 2.3	(70 dB) 2.2	(70 dB) 1.9	(70 dB) 2.0	(40 dB) 3.0	(20 dB) 3.6
	(90 dB) 2.8	(90 dB) 2.9	(90 dB) 2.7	(90 dB) 2.5	(90 dB) 2.5	–	(30 dB) 5.7
Ultimate Attenuation	← > 90 dB →					> 60 dB	> 30 dB
Size	← 1.27/64" x 1.3/64" x 3/4" High → Mounting Hardware Included					Hc 6/u	Hc 18/u
						can	can
Price (1-9)	← $40.60 →					$18.95	$7.95

SPECTRUM INTERNATIONAL INC.
Box 1084A Concord
Massachusetts 01742 USA

Shipping weights: Filters 2 oz. ea., Crystals ½ oz. ea. Registration Fee: $2.00; Air Mail: 31c per ½ oz. All Prices in U.S. Dollars.

RADIO TELETYPE

PART TWO

Jostein Gjerde, LA7MC

HOW THE TELEPRINTER OPERATES

We continue with the series. The teleprinter described below is different in some aspects from the common (in VK) model 7 Creed, however the basic principles are the same.

TRANSMITTER MECHANISM

The transmitter mechanism has a keyboard as on a typewriter. Under the type-bars, there are 6 steel bars or rails on edge, and these can move in the longitudinal direction (Fig 1). 5 of the bars are selectors, the 6th is called the release bar. The 5 selectors have sloping cutouts such that they be moved to right or left, depending on which character key is pressed. With 5 selectors you can get up to 32 different combinations.

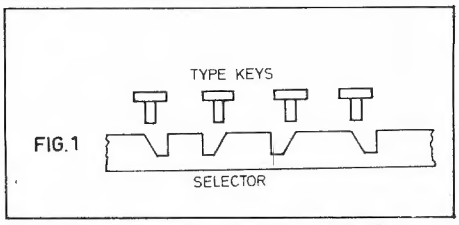


FIG. 1. TYPE KEY SELECTOR

The 5 selectors operate a contact head which is connected to a DC supply, and to the transmission roller (Fig 4).

The transmission roller is in principle represented as a ring with 6 conductive segments. A brush arm makes one revolution when the catch is raised by the release bar. The release bar moves to the left, whichever letter is pressed. When letter A is pressed, bars 1 and 2 move to the left and the 3 others to the right (see Fig 2). The release bar also moves to the left and releases the brush arm which is driven by 1 rev. by a motor with a clutch coupling.

The following impulses are transmitted.

1. Current break = Space. The start pulse. This starts the receiving roller.
2. Current = Mark.
3. Current = Mark.
4. Break = Space.
5. Break = Space.
6. Break = Space.
7. Current = Mark (stop pulse).

The 5 letter pulses depend on which letter is transmitted (here letter A).

When the transmitted arm stops because of the catch, the DC supply is coupled to the line. This stops the receiving cylinder.

RECEIVER MECHANISM

The Receiver roller has a brush arm with a catch. The catch is held fast by an electromagnet which receives current from the other station via the line. The receiver's brush arm must have the same rotary speed as the transmitters. On the receiving roller, the conductive segments are small, and on the transmitter roller, wide. Therefore, there is some room for a small difference in rotary speed. The brush arm stops after one revolution and starts again, each time a new signal is sent.

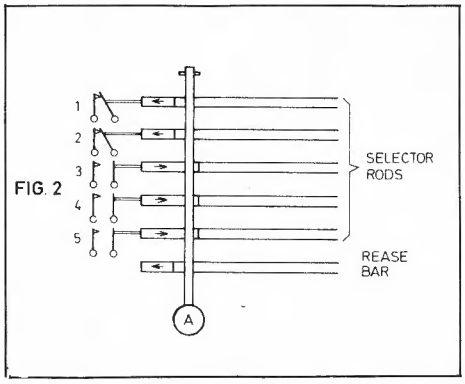


FIG. 2. POSITIONING OF THE SELECTOR RODS FOR THE LETTER A.

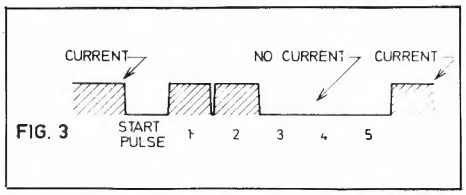


FIG. 3. CURRENT PULSES REPRESENTING THE LETTER A AS GENERATED BY THE KEYBOARD MECHANISM.

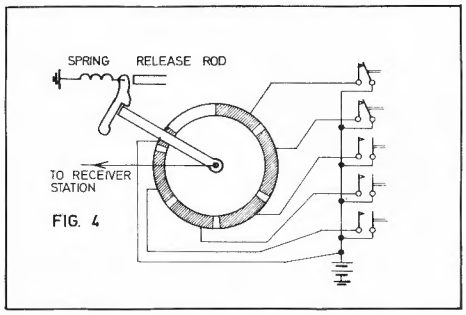


FIG. 4. COMMUTATING MECHANISM FOR PRODUCING CODED PULSES FOR TRANSMISSION.

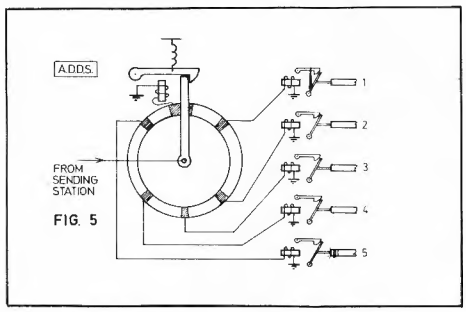


FIG. 5. COMMUTATING MECHANISM FOR DECODING RECEIVED PULSES.

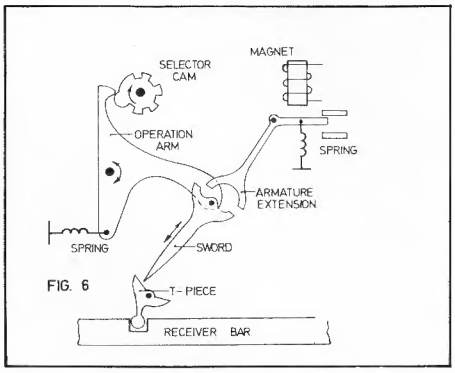


FIG. 6. SELECTOR MAGNET OPERATION OF RECEIVER RODS.

The receiver relay armature positions depend indirectly on 5 receiver bars. The indirect relation is necessary because interpretation can begin when the last impulse is received. In the meantime, a new character can be on its way.

The receiver mechanism has usually only one selector magnet and one group of 6 rotary cams placed in such a way on the axle that each cam operates at the instant the corresponding signal is transmitted.

Fig 6 shows the mechanical arrangement to convert the operation of the selector magnet to the positioning of the receiver bars to correspond with the received signal. When a space pulse is received, the armature releases. This operates a latch and thus allows the cam axle to make one revolution. The distance between the cams on the axle is such that when the first of the 5 pulses is received, the first cam will move the operation arm of the first receiver bar, and swing it a little clockwise. If the first received pulse is a Mark pulse, the armature will close and the movement of the operation arm will lift the 'Sword' and cause the right arm on the 'sword' to knock the right arm of

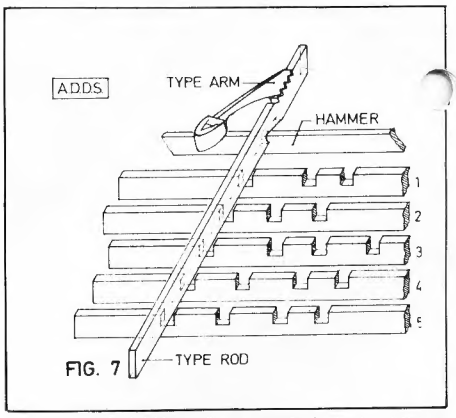
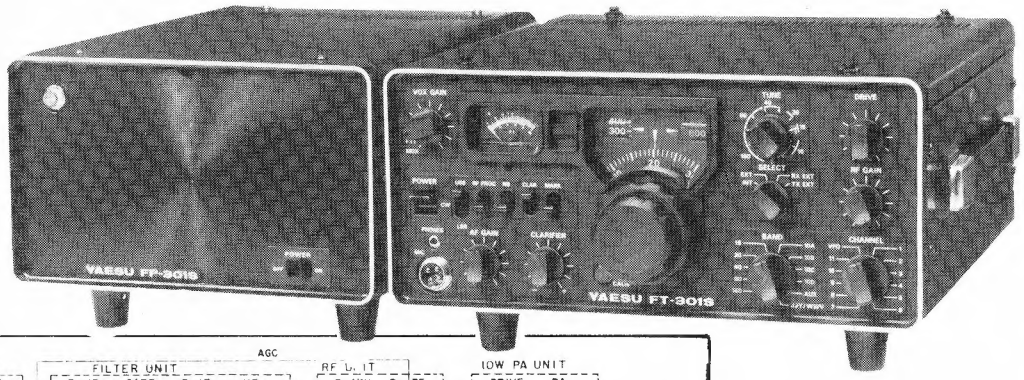


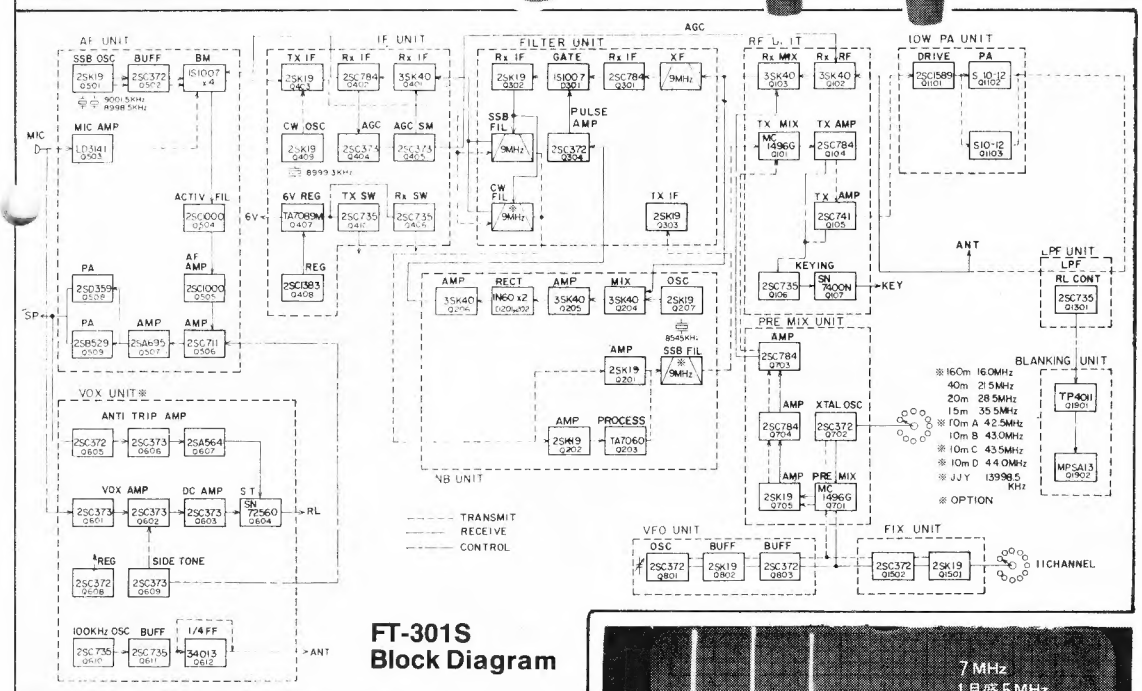
FIG. 7. LETTER SELECTOR MECHANISM.

TELETYPES, Repairs, Changeover Mechanisms, Spares, Paper Rolls and Tape, MACHINES FOR SALE. **Network Engineering, 492 Jones St., Ultimo, N.S.W. 2007. Phone (02) 211-4630.**

Latest addition to the YAESU line — FT-301S ALL SOLID STATE HF TRANSCEIVER

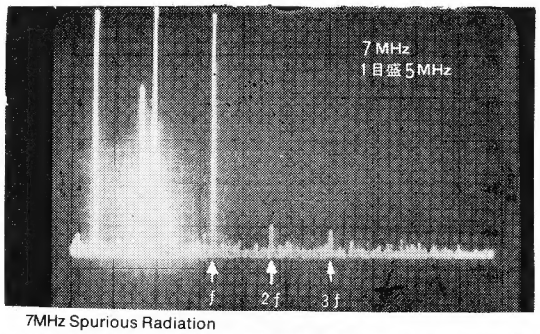


The FT-301S is an advanced fully solid state H.F. SSB and CW transceiver covering 160 mx thru 10 mx, including one auxiliary band and WWV. It has all the outstanding features of Yaesu's top performance FT-101E (inc. built in RF Processor) plus many more additions (compact, solid state final, low power consumption).

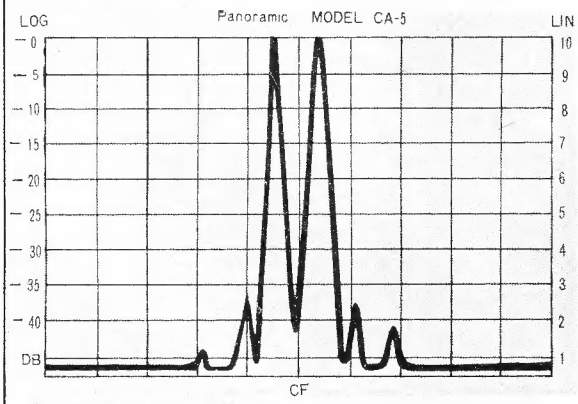


FT-301S Block Diagram

Eleven crystal locked channels and 10 Watts PEP make the FT-301S particularly suitable for the new Novice and, at a later date, a 100 Watt outboard linear amplifier will be available from Yaesu, enabling the FT-301S to be uprated for full licence operation. Additional plus features include automatic high VSWR protection of the final amplifier output transistors and selectable 100 KHz and 25 KHz calibration. Special care is taken to reduce unwanted harmonic radiation by the inclusion of separate double section Low Pass Filters for each band. Stocks of the FT-301S are expected toward the end of September.



7MHz Spurious Radiation



Graph shows Intermodulation products

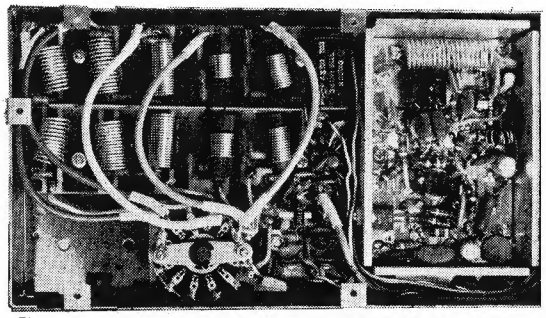


Photo shows double section Harmonic filter used in Final

Technical Data

Frequency Range
160m 1.8-2.0 MHz.*
80m 3.5-4.0 MHz.
40m 7.0-7.5 MHz.
20m 14.0-14.5 MHz.
15m 21.0-21.5 MHz.
10m A 28.0-28.5 MHz.*
B 28.5-29.0 MHz.
C 29.0-29.5 MHz.*
D 29.5-30.0 MHz.*
WWV 5.0-5.5 MHz.*
Aux. 27.0-27.5 MHz.

Mode
LSB, USB, (A3J)
CW (A1)

Input Power
A1, A3J, 20 Watts DC

Carrier Supp.
Better than 40dB

Adj. Sideband Supp.
Better than 40dB

Spurious Rad.
Better than —40dB

Audio Response
300-2700 Hz. ±6dB

Intermod. Distortion
Better than —31dB

Frequency Stability
300 Hz or better within the first 30 minutes and less than 100 Hz after warmup

Input Impedance
50 Ohm

Mic Impedance
500 Ohm

RX Sensitivity
0.5μV for 10dB S/N

Image Rejection
Better than 50dB

Selectivity
SSB —6dB at 2.4 KHz
—60dB at 4.0 KHz
CW —6dB at 0.6 KHz *
—60dB at 1.2 KHz

Crossmod
Better than 60dB with a 20dB signal at the ant. terminal 20 KHz away

Audio Output
3W at 10% THD.

Output Impedence
4 Ohms.

Supply Voltages
DC 13.5V Receive 0.4 Amp
Transmit 3 Amp (at 10W)
AC 234V Receive 40 VA
(With FP-301) Transmit 110 VA (at 10W)

Dimensions
280mm wide, 125mm high, 290mm deep

Weight
7 kg.

*Options

Anticipated Prices
FT-301S Transceiver $658
FV-301 Matching VFO $149
FP-301 Heavy Duty AC Power Supply $169.00
(May also be used to power 100W final)

bail ELECTRONIC SERVICES
60 Shannon St., Box Hill North, Vic. 3129. Phone 89 2213
Agents in all States and A.C.T.
FRED BAIL VK3YS
JIM BAIL VK3ABA
JAS7677-2-1

the armature extension. The 'Sword' will then turn clockwise such that when the cam is clear of the lug on the selector arm, the arm will swing back (because of the spring) to its original position.

The 'sword' will now push the arm of the T-piece to the left and swing it in a clockwise direction. The T-piece will, in this way, push the receiver rod No. 1 to the right. If the first pulse had been a space the rod would have been pushed to the left. In the same way the remaining rods are pushed in place in order and the 6th cam releases a clutch which allows the typing mechanism to operate.

The five receiver bars are displaced to right or left to correspond with the received signal. The slots in the receiver bars for the letter that was transmitted, will become aligned so that the type rod for that letter or character falls down and is struck by the hammer and the type arm is pushed towards the paper (see Fig 7).

After having completed one revolution, the cam axle will stop and the teleprinter is clear for a fresh reading.

(to be continued) ■

WHY RADIO FREQUENCY CLIPPING?

Harry Leeming, G3LLL
C/- Holdings, Mincing Lane and Darwen St.,
Blackburn B.B2—2AF, U.K.

There cannot be many Hams who at some time or another have not experimented with audio processing and clipping. In the past, on AM, results were quite encouraging, but for some reason the things just don't seem to work in many cases with SSB — why? Here are a few thoughts on the topic by G3LLL.

A typical block diagram of an audio processor which includes clipping and compression is shown in figure 1. This kind of unit looks quite impressive, but let us examine it stage by stage and see what we have to gain if we connect it into a good quality single-side-band transmitter.

PREAMPLIFIER AND PRE-EMPHASIS STAGE

This stage does just about everything that a decent microphone (plus, perhaps, a bass-cut capacitor) should do. If you are short of audio gain or if you use a microphone with a bassy response, it may help, but if you use something with plenty of output and a controlled response such as, say, a Shure 444 you will gain little or nothing.

THE COMPRESSOR STAGE

The ALC circuit in any correctly operating amateur SSB transmitter makes a very good audio compressor; why add another in series?

CLIPPING STAGE

Most ALC circuits derive their output from the PA valves grid. Before this type of circuit can work, the PA valve has to be over-driven, and in this condition the cathode and grid form a clipping diode limiting the audio peaks and giving, whether you want it or not, several dB's of radio frequency clipping. The small amount of clipping obtained may not increase the *loudness* of the signal as much as 20 dB's of audio clipping, but as it will not produce any audio harmonic distortion, in many cases it will do just as good a job of improving the intelligibility.

THE HIGH FREQUENCY FILTER

Whilst a separate audio high frequency filter may be needed to prevent square wave effects after audio clipping, it is certainly not needed to clean up any signal which is going to be passed through an SSB filter. An SSB filter has a very clearly defined response and this ensures that any high frequency distortion products are "chopped off".

Whilst, doubtless, an audio clipper will help sometimes, I doubt if it has much to offer when used with single side band equipment if the following conditions are already met:

1. A good communications type microphone with a rising response and adequate audio output is used.
2. The transmitter has an efficient ALC circuit which is derived from the PA grid.
3. Adequate drive with some clipping at the grid of the PA valve is available on all bands.

Although many would argue otherwise, my own experience is that under these conditions the only clipper giving any real hope of more than a dB or two improvement is a radio frequency clipper.

RADIO FREQUENCY CLIPPING

To refresh your memory, the general layout needed for an "add-on" radio frequency clipper is shown in figure 2. The double-side-band signal is taken from the transmitter, and first of all converted to single-side-band by the clipper's filter FL.1. The *then* single-side-band signal is amplified by an amount necessary to ensure adequate clipping and is then clipped and fed via the output control back to the associated transmitter.

If things are working correctly it is impossible for a radio frequency clipper to *generate* audio harmonic distortion, as the SSB signal fed to the clipper diodes consists only of a bunch of radio frequencies. Harmonic distortion products in this case are at twice or more times the *radio frequency,* and so are filtered out by the simplest of tuned circuits. At very low levels of clipping no additional filtering is necessary, but as clipping is pushed to the higher levels needed to provide a meaningful improvement in performance, intermodulation distortion does occur and causes the signal to spread out on to adjacent channels. For this reason the signal is then fed back into the transmitter via the transmitter's original SSB filter which removes the additional side bands which have been generated by the clipping process.

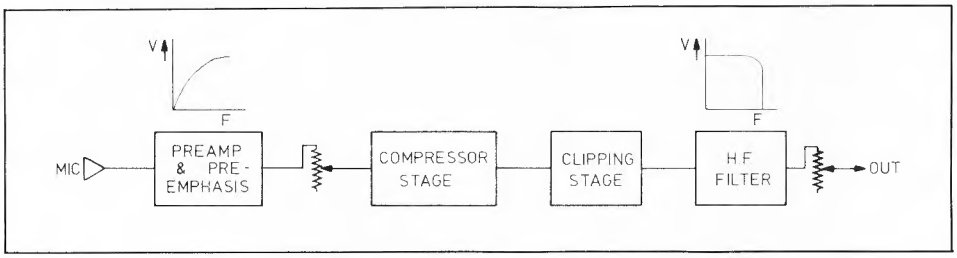


FIG. 1. AUDIO CLIPPING BLOCK DIAGRAM.

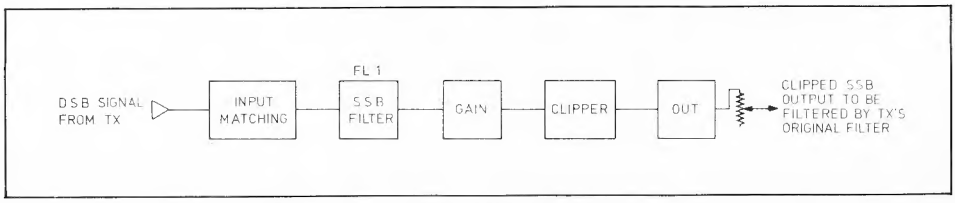


FIG. 2. RF CLIPPING BLOCK DIAGRAM.
NOTE: Clipping Level adjusted by Tx's mic gain control.

RF CLIPPING DOES NOT ALWAYS WORK WONDERS

Have you ever been prescribed a wonder drug for hay fever? I was, and it certainly worked; that is, I think it did; but the trouble was I hardly ever woke up sufficiently to sneeze! RF clipping can also have its problems.

HEAT

Most single-side-bands rigs are rated for a 50% duty cycle on CW, and for less than this at higher power on SSB. When using any form of clipping, the speech duty cycle becomes considerably extended and if the extreme of infinite clipping was to be applied the duty cycle would become 100%. At the more realistic levels commonly used, of around 15-20 dB of clipping, you should be safe if you keep within the *CW ratings,* and if your equipment is not fitted with a blower, you fit one.

DISTORTION

RF clipping properly applied does not *cause* objectionable harmonic or intermodulation distortion, and speech can sound excellent even at 30 dB of clipping. How then do the distorted signals which we all hear on the air on occasions, occur? The purpose of clipping the peaks is to boost up the low level signals, and RF clipping boosts up all low level signals. Distortion is, however, a low level signal, and suppose for a moment that before the application of clipping, your rig has an inbuilt distortion level of 5%. This level of distortion is quite acceptable in amateur practice, and frankly no one is likely ever to have commented. If you do go ahead and add a radio frequency clipper after the stages which have produced the distortion, you will boost up the distortion. If you go as far as to add clipping in the region of 20-30 dB, the distortion will become boosted until it is nearer to 50%, and then you will be told that your clipper is causing distortion. It is not causing distortion; it is simply amplifying the distortion which already exists.

HUM

Here the same argument applies, as any hum which is introduced by the microphone lead, or in the early stages of the transmitter, will be boosted by an amount depending upon the level of clipping. Recently, I had a case where a RF clipper was accused of causing hum. Upon examination of the FT101 being used with it, hum could just be heard when the signal was at the S.9 + 40 level without the clipper, but this had never been noticed over the air until the clipper was fitted. Further checking located a poor chassis return from the transceiver's AF board and resoldering this completely removed the hum, with or without the clipper.

MICROPHONE

First remember that RF clipping shows up everything, and microphone distortion will be just as mercilessly amplified as any other kind of distortion. Frankly, if you do not wish to invest in a good quality microphone, you will be wasting your money on a radio frequency clipper.

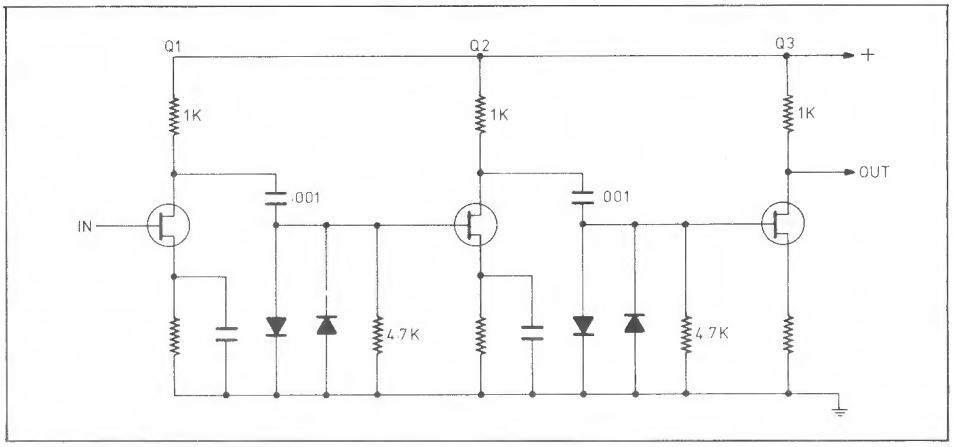


FIG. 3. RF CLIPPING CIRCUIT. GAIN OF Q2 SET AT APPROX. 10 dB.

The frequencies which carry most information in speech are in the octave and a half above 1 kHz, and whether you use clipping or not, a microphone which has a peak response in this range will give maximum talk power. If you want to get the best possible from *any* type of clipping you must use a microphone with a rising response, and even if you use a good mic it is still worthwhile adding extra low frequency cut.

I use a Shure 444 microphone, and I have modified the VOX/PTT switch so that it adds a 2000 pF capacitor in series with the audio lead in one position. Under poor conditions switching in this capacitor is at least as good as doubling the power but somewhat cheaper!

CLIPPING CIRCUITS

I could be wrong, but I am not personally very keen on using arrangements where clipping diodes are associated with tuned circuits. Under these conditions it is very difficult to measure just what is happening, and I cannot help feeling that it might just be possible for phase modulation to occur at some signal levels as the diodes change capacity with signal voltage. The very simplest arrangement is resistance capacity coupling; it only being essential to ensure that there is adequate dynamic range so that clipping definitely occurs in the diodes and not in the transistors. In this connection it is helpful if two stages of clipping are used as shown in fig. 3, the gain of Q2 being adjusted so that at the maximum level of clipping desired, say, 20 dB, clipping is shared equally by each stage.

DOES RF CLIPPING REALLY WORK?

With a generously rated transmitter having an inherent level of distortion in the high fidelity class, it should be possible to run 40 or 50 dB of RF clipping and gain anything up to fifty times effective increase in power. Under these conditions perhaps it would be necessary to operate under ground in a padded cell to keep blower and room noises down to a reasonable level, but in any case the consideration is purely academic.

In more practical terms I use radio frequency clipping with my Yeasu FT101 mainly in a static mobile condition. Without the engine running I get only 12 volts out from the battery, and so the FT101 runs at reduced power. Under these conditions I can really "push" the FT101 without worrying about overloading the power supply or PA valves, and I often use 20 dB or more of clipping. Even at these levels of clipping I often get unasked-for comments of "excellent speech quality", and some stations have told me that apart from being much louder and easier to read with the clipper, the speech quality is actually better! This may be due to over-enthusiasm, but certainly the sound quality at any level of clipping which is within the capabilities of the FT101 is of a kind that will not upset the most critical listener.

RECEPTION

As explained previously, before you can incorporate RF clipping it is necessary to purchase an extra SSB filter which usually is quite an expensive item. With quite a few transceivers it is possible to design the clipper so that the extra SSB filter is in circuit on reception as well as on transmit. The extra filter gives quite a notable improvement in skirt selectivity which is well worth having as it is "thrown in free of charge". This approach is not possible with all transceivers, but if you are home brewing a radio frequency clipper the possibility should certainly not be overlooked.

CONCLUSION

Radio frequency clipping is not cheap, but dollar for dollar it seems a much better proposition than a linear amplifier. If you really want to "flatten the opposition" there is no reason why it should not be used in addition to a linear, in which case you will have talk power in the broadcasting station class! RF clipping will make an excellent rig, even better, but as it amplifies everything including any hum or distortion, one should not try and incorporate it in any equipment which is the slightest amount under par in audio quality or else the results will be disastrous. ■

NEWCOMERS NOTEBOOK

Rodney Champness, VK3UG
David Down, VK5HP

SUPPRESSION OF ELECTRICAL NOISE CAUSED BY VEHICLE ELECTRICAL SYSTEMS

Reducing the electrical noise generated by the ignition and general electrical circuits of a car down to a level which does not interfere with mobile two way radio contacts can be a difficult job. If you are able to determine the source of the interference and then determine the entry path of the interference to the radio equipment you are well on the way to being able to suppress it.

As I stated in my previous article on this subject in March 1975 issue, *the whole of the interference source must either be shielded completely or have suppression filters fitted where shielding is not practical.*

TRACING THE SOURCE OF THE INTERFERENCE

Tracing the source is not all that difficult as long as the task in hand is approached in a logical manner. It is assumed that the mobile has been installed in the vehicle, and can be either VHF or HF as the techniques for interference tracing are similar. Do not assume that your VHF FM transceiver will not be affected by the vehicle electrical noise because it will be, but the effects under most conditions of operation will not be particularly noticeable. Do not assume that because your set has a noise blanker or noise limiter that its performance will not be improved by attention to vehicle suppression. The reasons why this is so could be a subject of an article in itself.

With the set turned on and listening to a weak station, turn on the vehicle ignition and leave it on for about a minute. If an intermittent plopping sound is heard this will most likely be coming from the voltage regulator fitted to some cars for the proper operation of their dashboard instruments. The cure for this is shown in my previous article. With the ignition on, turn on various devices within the car — heater motor, windscreen wipers, tail-gate motor, turn indicators, then try bouncing the back of the car to cause the fuel gauge float to move. Some or all of these units will cause trouble but will in most cases respond to the fitting of a capacitor from the active lead (or leads) to earth using short leads. The capacitor value should be in the range of 0.1uF to 3uF, ceramic or the type used in suppression work for car radio installations. In stubborn cases, some shielding or the fitting of RF chokes into supply lines may be necessary. The interference generated from these sources may not be evident sufficiently often to warrant suppression, e.g. if you only go mobile in dry weather suppression of the windscreen wipers may be a waste of time.

Having sorted out all the items causing interference whilst the car engine is not running, now comes the real test — start the motor and see how much trouble you have from this source. *Interference and how?????* With the engine idling or running at a couple of thousand revolutions per minute, the steady "tick-tick-tick" of the spark ignition system will be heard. Possibly another couple of noises will be heard, one could be a whine which increases in pitch as the speed of the motor is increased, and the other is a ragged scratching type of noise which is not always present and varies erratically with the charge condition of the battery, engine speed and electrical system load. The first is caused by the alternator or generator and the second is caused by the regulator. This article will concentrate on the noise caused by the ignition and battery charging circuit.

HOW THE INTERFERENCE GETS INTO YOUR RECEIVER

You will automatically say through the aerial, of course — everyone knows that. But does it? Not always, it sometimes comes in through the power leads, through defective earthing of aerial and power cables, through speaker leads and microphone leads. The most likely of these sources is the power leads. How can this be determined? With the engine running at a thousand or so revolutions, remove the aerial lead from the set. If the interference is coming through one of the leads mentioned previously, or is being picked up directly by the set, or if it is poorly shielded, interference will still be heard in the receiver. If shielding is a problem metal shields of some sort can be made up, or alternatively aluminium foil can be draped around the set and suitably bonded to act as a temporary shield..

If possible, try the set on a separate 12 volt battery, and most likely the interference will disappear. It is impractical to run the mobile station on a separate battery normally, so some means of keeping the interference out of the power line must be found. For example, many of the cheaper cassette players require a power line filter such as shown in Fig 1. These are not very practical where the current drain is more than a couple of amps or so, certainly not for a rig drawing 20 amps. If a filter is required it is usually only required in the low level stages so it needs to be wired into the particular part of the set affected. This type of interference is mostly within the audio spectrum, and fortunately it is uncommon for the RF component to affect the set when introduced into the set in this way. The exception here of course is when a design brings the power lead into the proximity of the aerial terminal or any sensitive low level RF stage. This is a case of bad equipment design. However, before you start rebuilding your equipment it is suggested that you try the interference suppression system described below.

RADIATED INTERFERENCE

Most of the interference that you will receive in your mobile will be of the radiated variety and as such is picked up by the aerial, if it happens to be within the noise field generated by the vehicle electrical system. The mobile aerial should be located as far from the noise producing source as is practical, usually at the opposite end of the vehicle to the engine. However, if you do a particularly good job of suppressing your vehicle's electrical system the location of the aerial n[illegible] be mounted where it will conveniently do a good job.

Some time back Gavin VK3HY and Rodney VK3UG went mobile on HF only to discover that the mobile heard whilst stationary with the motor stopped, disappeared when the engine was started despite the fact that the HF transceiver was fitted with a noise blanker. Gavin and Rodney discovered this problem at great length and it was decided that something should be done about it. Each recollected the various methods that they had seen used and a decision was made to try and refine a method where fly wire had been placed over the high tension leads of the vehicle ignition system. The method that is to be described shortly is an outgrowth of the system fitted to Gavin's car.

The interference generated by the ignition system is radiated in all directions escaping under the car, through the cracks and slits around the bonnet, and is conducted and reradiated from the v[illegible]ing, exhaust, etc. See Fig 2 for example.

The interference radiated by the ignition must be prevented from leaving the vehicle engine compartment. The most effective way is to completely shield each spark plug line, each spark plug, the dis-

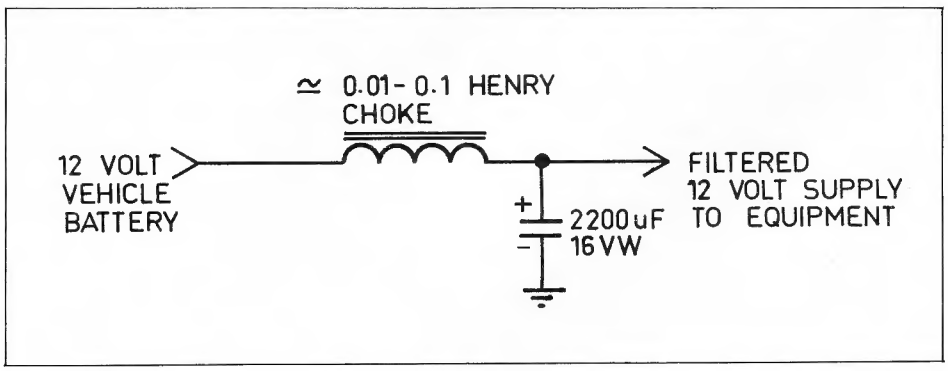


FIGURE 1

DRAKE R. L. DRAKE COMMUNICATIONS GEAR

DSR2 Digital readout communications **RECEIVER** 10 kHz-30 MHz continuous coverage, fully synthesised, for AM-USB-LSB-CW reception. **$3740.**

SPR4 communications **RECEIVER** for AM-USB-LSB-CW reception. Direct frequency dialling 150-500 kHz plus any 23 x 500 kHz ranges between 0.5 and 30 MHz. **$810.**

R4C Amateur **RECEIVER** covers HF ham bands plus any 15 x 500 kHz ranges between 1.5 and 30 MHz except 5.0 to 6.0 MHz. **$775.** (Transceives with T4XC.)

SSRI Synthesised communications **RECEIVER.** Provides continuous coverage 500 kHz to 30.0 MHz for AM-USB-LSB reception. Operates from AC Mains or internal batteries. Now only **$260.**

TR4C sideband **TRANSCEIVER** full amateur band coverage 10 through 80 metres. **$775.**

T4XC sideband **TRANSMITTER** full amateur band coverage 10 through 80 metres plus 160 metres accessory crystal plus 4 fixed frequency positions. **$730.** (Transceives with R4C.)

MN4 and MN2000 MATCHING NETWORKS — enable Feedline SWRs of up to 5:1 to be matched to the Transmitter. Built-in Wattmeter. MN4 handles 200 Watts. MN2000 handles 1000 Watts continuous and 2000 Watts PEP. MN4 **$135.** MN2000 **$265.**

SSR1 RECEIVER

TV — 42 — LP FILTER for Transmitters below 30 MHz — 100 Watts continuous. **$17.50.**

TV — 300 — HP FILTER — TV Set protection from transmitters 6 — 160 metres. **$13.00.**

TV — 3300 — LP FILTER 1000 Watts continuous to 30 MHz with sharp cut off above 30 MHz. **$31.00.**

RP500 — Receiver **PROTECTOR** for Receiver front end protection from close proximity high power transmitters. Less than 0.5 dB Insertion Loss to 30 MHz. **$77.00.**

W4 WATTMETER/SWR METER 2 — 30 MHz with 200 Watt and 2000 Watt ranges. **$78.00.**

WV4 WATTMETER/SWR METER 20 — 200 MHz with 100 Watt and 1000 Watt ranges. **$90.00.**

AC4 POWER SUPPLY for mains operation of TR4C or T4XC. **$175.00.**

DC4 POWER SUPPLY for battery operation of TR4C or T4XC. **$190.00.**

FS4 FREQUENCY SYNTHESIZER — provides continuous frequency coverage for R4 and SPR4 receivers and TX4 transmitters. **$300.00.**

NIPPAN FC3A FREQUENCY COUNTER — 15 Hz to 250 MHz, operates from mains or inbuilt batteries. **$258.00.**

TELIHAMVISION OM-7 SLOW SCAN TV CAMERA and monitor — complete. **$995.00.**

MOSLEY ELECTRONICS — 3 Element **BEAMS** — arriving soon.

★ **PRICES INCLUDE SALES TAX.**
Write, 'phone or call for technical information.

ELMEASCO

Instruments Pty. Ltd.

P.O. Box 30, Concord, N.S.W. 2137.
Telephone: 736-2888
Melbourne: 233-4044; Adelaide: 42-6666;
Brisbane: 36-5061
Perth: 25-3144; Wellington N.Z.: 69-7566.

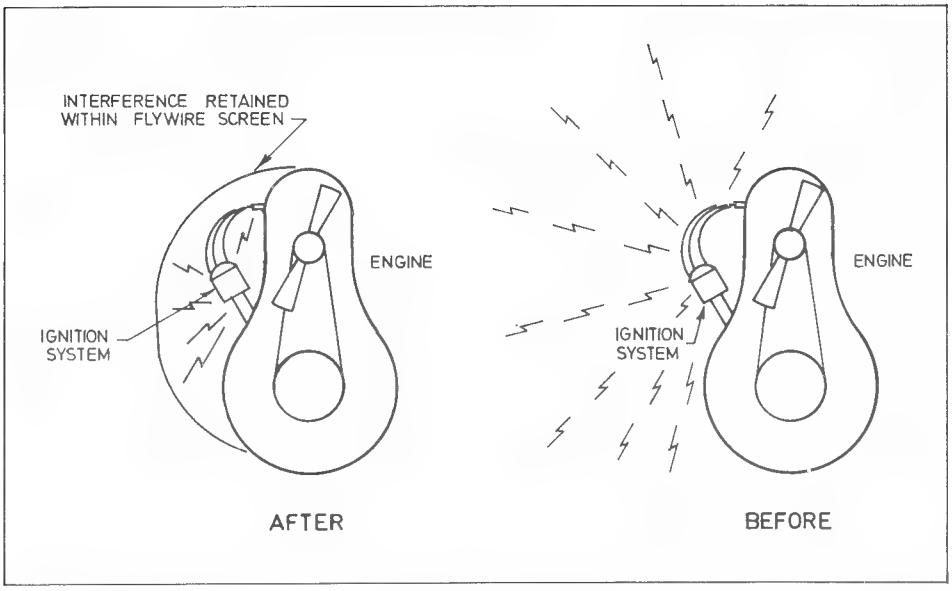


FIGURE 2

tributor, and the coil, and then filter the low tension battery supply line. A method of doing just this was shown at length in Amateur Radio for March 1975. It is extremely effective. It is a lot of work, but well worth it in critical situations.

Another way of completely shielding the ignition system is to put a complete shielding box over the whole of the system, and this is *almost practical* where all the ignition components are mounted on one side of the engine. Fortunately it has been found by experiment that it is not necessary to completely shield the ignition system, and a few holes for the interference to leak through do not raise the level of interference to a high level. The experiments have been conducted on 3 Holden cars (2 HQ models and one a couple of models before) each with success.

INTERFERENCE SUPPRESSION ON THE HQ HOLDEN

The method of suppression described is specifically for the HQ Holden, but the principles apply equally well with vehicles of other manufacture. The main interference suppression shield consists of *bronze* fly-wire, cut, folded and soldered as shown in Fig 3. The top of the screen is screwed to the rocker cover. The edge of the rocker cover is sandpapered so that good contact is made along the top of the fly-wire screen. The screen is attached by 5 small diameter self tapping screws to the rocker cover. The rocker cover should be removed to do this work. The studs which hold the rocker cover to the block are sandpapered down to bare metal as is the area surrounding each of the holes for the studs in the rocker cover. This is done to make sure of good electrical contact between the rocker cover and the engine block.

The bottom end of the screen is attached to various spots on the block of the engine. "B" is bolted to a small unused tapped hole at the rear of the engine in front of the clutch housing. The two holes "A" are bolted to a portion of the oil filter and the lug "C" is bolted under one of the timing case cover bolts. It is necessary to make sure none of the bolts or the threaded holes in the block are rusty or the efficiency of the suppressed system will suffer. The front of the screen nearest the radiator fan should be wired to the fuel and vacuum lines so that insects are not blown behind the screen.

Prior to fitting the screen, the coil LT line must be suppressed. The ignition coil is rotated through 180 degrees. The coil and ignition leads are re-located below the coil to keep them away from the spark plug leads. The ignition switch line is filtered with a Ducon PNC51 coaxial feed-through capacitor mounted on the side of the coil. There is a small bracket on the side of the coil mount just for this purpose. The lead that went to the terminal nearest the coaxial capacitor (in the ignition switch line) is disconnected from the coil, and attached to the bottom terminal of the coaxial capacitor. The top terminal is bridged with a short piece of wire to the vacant coil low tension lead. Once the screen is refitted, the suppression of the ignition system is complete, and the cost is of the order of $5. However, this amount of suppression is not usually enough as the alternator and regulator often contribute a considerable amount of interference.

It is necessary to shield the brown and blue wires going between the alternator and regulator. The cream coloured terminal block is removed from the two terminals at the alternator end by putting a sharp thin device down the front of each terminal entry to push each retaining lug out of its notch, and each terminal is then withdrawn noting which terminal went into which part of the block. The wires are slipped into a length of ⅜ in. coaxial cable braid which is earthed at the regulator and alternator. The red alternator to battery wire is filtered by fitting a Ducon PNC51 coaxial capacitor into this line and mounting the capacitor to the frame of the alternator, with a small short gutter bolt in a vacant hole on the back of the alternator. The red lead is cut, one end going to one capacitor terminal, and the other lead end to the other terminal. Another coaxial capacitor is fitted to the brown wire from the regulator which disappears into the main wiring loom. The wire is cut as for the red lead and attached to the two terminals. The capacitor is mounted as close as practical to the regulator.

Usually the work as outlined above is sufficient to quieten most alternators and regulators, but some require more. It is possible to buy suppressed voltage regulators from Bosch or from their distributors Motor Spares. The type number of the suppressed regulator is RS35NS. Although an improvement, the suppressed regulator is still somewhat noisy. A Trend GR12 solid state regulator was obtained from Clayton Diesel Electrics Pty. Ltd., Cnr. Green Street and Power Road, Doveton, Victoria. The solid state regulator has proved to be quiet and is cheaper than the Bosch suppressed regulator. The generating system should now be completely quiet unless you have either made some mistake in the suppression technique, or you have a defective alternator. Some alternators have extremely noisy diodes but they are not defective in any other way.

A number of bonding straps are used to earth together various items within the car that are often not earthed directly to one another. A prime example is the exhaust pipe. This is earthed at the engine to the vehicle body but is held off the car by insulated hangers right to the back of the car. The exhaust can act as an aerial for the interference. For this reason a number of bonding straps are fitted between suspected interference radiating areas. The straps can be made out of ⅜ in. or 1 cm wide copper braid. Bonding straps are required between the engine block (rear) and the fire wall, across the passenger and driver side bonnet hinge (make sure the bonnet is electrically connected to the braid as sometimes paint on the bonnet acts as an insulator), across each resilient engine mount to vehicle cross member, and one from the last exhaust pipe hanger to the car body.

SUMMARY

Having done all of these things you should now have a car that is fairly quiet electrically and signals down to a microvolt or so should be quite readable on your receiver without recourse to the use of a noise limiter, and the use of a noise limiter or blanker should get rid of the last vestige of interference. All earthing points must be sandpapered or scraped back to bare metal and bronze fly-wire must be used for the shield (not the cheaper aluminium or steel wire). After a number of months it may be found that the interference does come up a bit. If this is so, check that all earths are clean and clean the bronze

THE MORSE CODE MADE EASY

An album of three Records produced with Ivan R. Hodder by the Flight Training Centre (Aust.) Pty. Ltd. Revolutionises the learning of Morse Code all you need is the family Record Player!

The F.T.C. course has discarded the old now outmoded system of learning the Morse Code by visual means alone. Those learning the Code by this method are progressed beyond five words per minute. This course is designed to teach auto recognition of the symbols as the student will hear them in actual use.

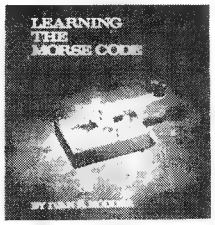
The symbols are always transmitted at the same speed otherwise their aural characteristics alter and only the spacing between groups slowed down or speeded up as the student gains proficiency.

In addition the student is taught to sing the symbols with a correct rhythm so becoming his own transmitter during the most critical phase of the [illegible].

He hears an oscillator signal for the first time only after becoming proficient at six words per minute using the singing technique. He then starts at four words per minute working back up to and beyond the six words per minute already achieved.

[illegible] of the efficiency of this system is the large increase in passes by those who have used it.

PRICE:
3 Record Set Complete With Instructions Post Paid **$16.75**
3-Cassette Set Complete With Instructions Post Paid **$16.75**



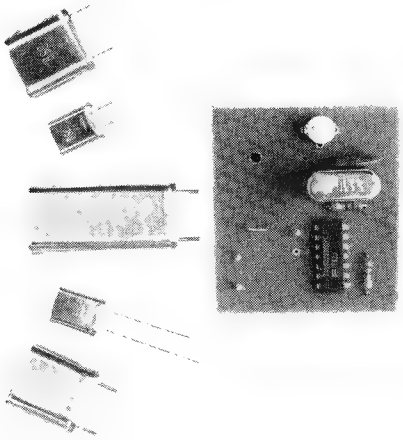
Available from . . .
WILLIAM WILLIS & CO.
PTY. LTD.
77 Canterbury Rd., Canterbury, Vic. **3216**
Phone 836-0707

TO COMPLEMENT OUR USUAL RANGE OF CRYSTALS

BRIGHT STAR CRYSTALS PTY. LTD.

35 EILEEN ROAD, CLAYTON, VIC., 3168. Phone: 546-5076 (Area Code 03)

CAN SUPPLY A RANGE OF —



- **OSCILLATORS**
- **WIDE-BAND AMPLIFIERS**
- **TTL & CMOS DECADE COUNTERS**
- **ELECTRONIC CRYSTAL OVENS**

INTERSTATE AGENTS:
Adelaide: ROGERS ELECTRONICS — Phone 42 6666
Brisbane: FRED HOE & SONS PTY. LTD. — Phone 47 4311
Perth: COMMUNICATION SYSTEMS — Phone 76 2566
Hobart: DILMOND INSTRUMENTS — Phone 47 9077

INTERSELL ELECTRONICS PTY. LTD.

TRANSCEIVERS

SWAN 700CX — 700 W PEP Input. Standard Model 8 Pole filter and also 700CX SS16B with 16 Pole filter — P.O.A.

SWAN 300B — 300 W PEP input. USB and LSB Xtal calbr. with Standard and 16 Pole filter. Complete with integral PSU and Speaker — $489.00

SWAN SS200A — All Solid State 300 W PEP input incl. VOX, Noise Blanker, SW Sidetone, Xtal calibr. and complete VSWR protection with special 16 Pole filter — $750.00

POWER SUPPLIES

230XC — Complete with Cabinet and Speaker for 700CX. 230X PSU only. Both for 240 V AC mains, complete with supply leads and plugs — P.O.A.

PS220 for SS200A — $169.00

WATTMETERS

WM1500 — 1.8 MHz to 52 MHz, 0 to 1500 W RMS in 4 ranges 5/50/500/1500 W. Large easily read meter with forward power switch and reflected power — $65.00

PEAK READING WATTMETER — reads PEP and RMS power up to 2000 watts in 3 ranges incl. reflected power — $80.00

Secondhand FT101 with factory fitted 160MX complete with VFO fan and CW filter. Immaculate condition complete with manuals — $500.00

MICROPHONES

444 SHURE desk mikes adjustable height, locking bar with VOX switch facility — $45.00

404 SHURE hand mikes — both mikes now in stock again. Proven popularity due to specific tailoring for SSB. Both models complete with lead and plug — $35.00

ANTENNAS

Two Element TB2HA — $160.00
Three Element TB2HA — $225.00
Four Element TB2HA — $290.00
Solidly made antennas with all elements active on 20/15/10 MX.

MOBILE ANTENNAS

SLIMLINE 500 W PEP Mobile Antennas with base section, coil and adjustable top whip of stainless steel.
15MX — $35.00
20MX — $40.00
40MX — $45.00
HD Spring — $16.00
HD Mount — $16.00

VALVES

Most Valves for Swan equipment in stock — $10.00 ea.
8950 6HF5, 6LQ6/6MJ6. Available in matched pairs.
FC76 Digital Freq. Meter Read TX Freq. — $175.00

All prices quoted are subject to changes without notice, but are inclusive of Sales Tax. Freight and Insurance extra.

SOLE AUSTRALIAN DISTRIBUTORS FOR SWAN AMATEUR AND COMMERCIAL RADIO EQUIPMENT:

VK2AHK **3 MIDSON ROAD, OAKVILLE, N.S.W. 2765 — PHONE: (045) 73 6215**

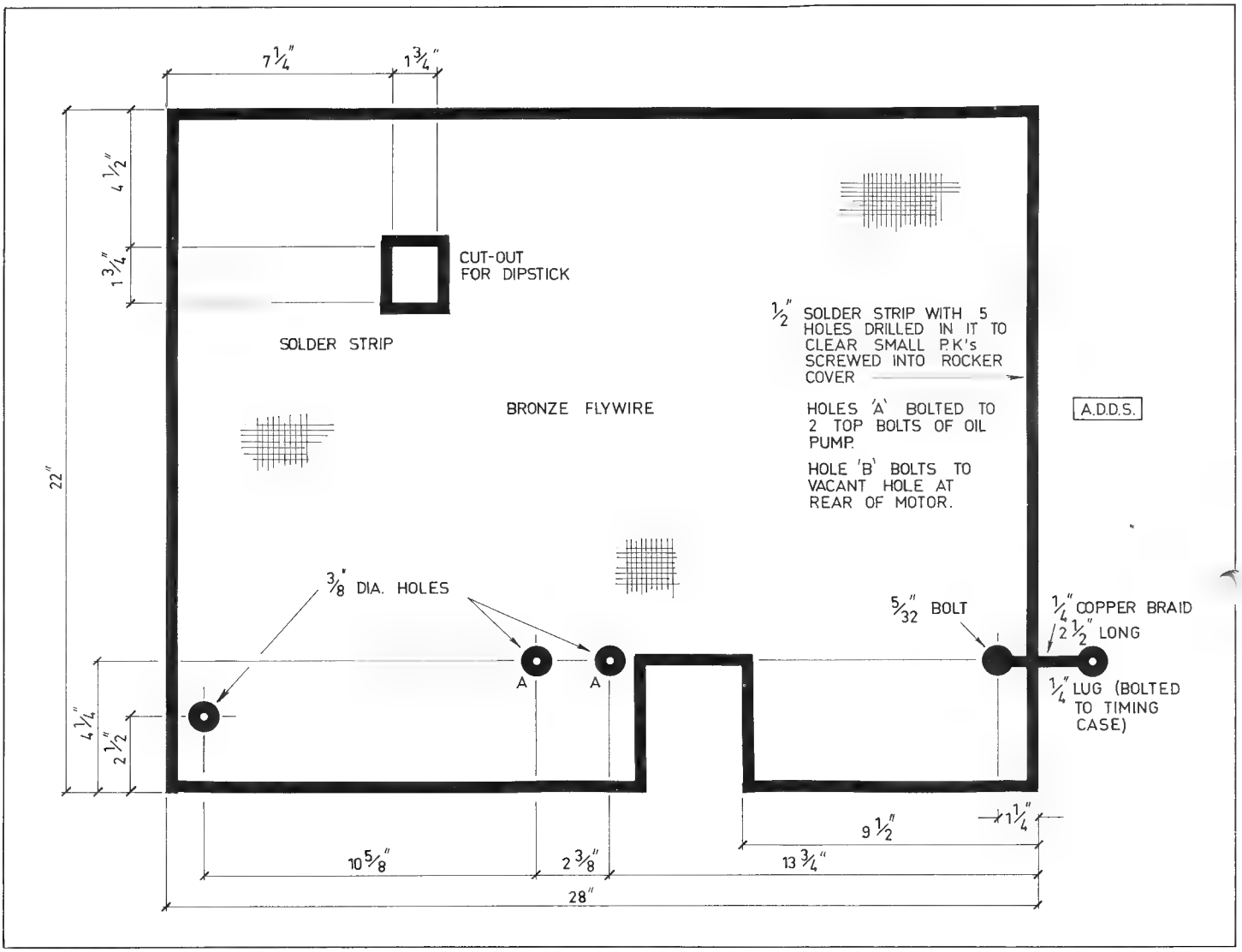


FIGURE 3

fly-wire, or if very fouled, replace it. This method of suppression is cheap and costs less than $30 for all of the items required including the regulator if needed. It is extremely easy to remove the shield for servicing — just remove 5 screws and undo 4 bolts and the shield comes out. The carbon trace leads must be retained on the ignition system for the shielding to work.

References to read for further information are:

A.R. March 1975, page 5 — Vehicle Ignition Noise Suppression, by R. Champness VK3UG.
A.R. Jan. 1975, page 17 — Ignition Noise Reduction, by G. Sones, VK3AUI.
A.R. July 1976, page 11 — Starting Mobile Operation, by Maurice Evered VK3AVO.

Some time back the author obtained a copy of "Eliminating Engine Interference" by John D. Lenk. This book does not seem to be available here in Australia and was obtained direct from Ham Radio Magazine for $U.S. 4.50. The book deals exclusively with interference, methods of suppressing it, circuits used in receivers to overcome some of the interference problems, and some of the suppression kits that are available in America. Vicom International are agents for some of these, and all are more expensive than the system just described. If you are serious about getting rid of interference from a mobile environment you should try and get this book. It is a Howard W. Sams publication and bears a number 21004 which could be a stock number. ■

TECHNICAL CORRESPONDENCE

The Editor,

Dear Sir,

The Audio Staircase Generator (AR Dec. 76) has been in use for over 12 months without any noticeable drift in performance or output bias level. However, on a couple of occasions, one of the multivibrators has failed to start when the power supply is switched on, on the "mains" side.

The reason is simple enough; there is no "self-start" circuit incorporated. In my case it is of little importance, as the unit is normally turned on by plugging it into a supply that is turned on already, and the sharp turn-on transient is sufficient to ensure reliable starting.

This may not be satisfactory for all applications, and a modification to the original circuit to include a "starter" gate is then necessary. Fig. 1 shows the func-

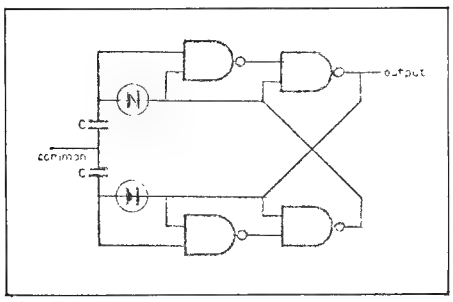


FIGURE 1

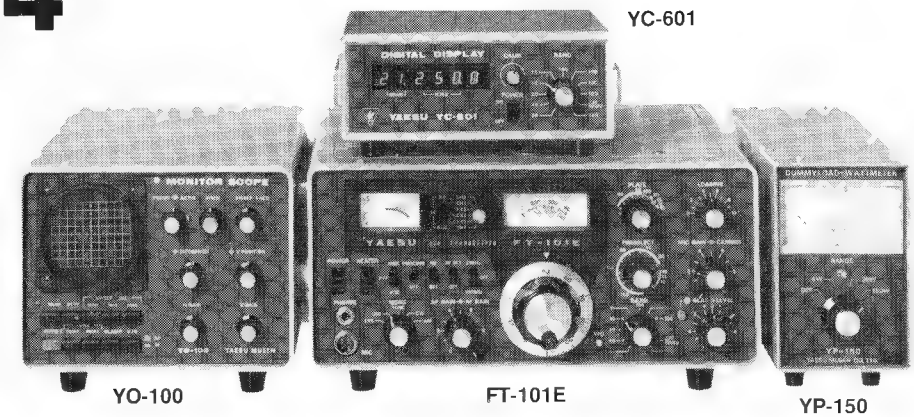
YAESU

Now an addition to YAESU'S range of measuring instruments . . .

QTR-24

24 hour World Clock

QTR-24



YC-601

YO-100

FT-101E

YP-150

Yaesu has now made an addition to their already well known range of measuring instruments, it is the QTR-24, a 24 hour World Clock. With a glance the time in any principal city or time zone can be simultaneously co-ordinated with local time on a 24 Hour basis. The QTR-24 is powered by a 1.5V dry cell, which has a normal life of approximately one year. No amateur or SWL station could be complete without one.

Also shown in the photograph is the YO-100 monitorscope, FT-101E transceiver, YC-601 digital readout adapter and YP-150 dummy load-power meter.

QTR-24 PRICE $33

bail **ELECTRONIC SERVICES**

60 Shannon St., Box Hill North, Vic. 3129. Phone 89 2213
Agents in all States and A.C.T.

FRED BAIL VK3YS
JIM BAIL VK3ABA

JAS7677-3

zephyr products

70 BATESFORD ROAD, CHADSTONE,
VICTORIA, 3148, AUSTRALIA

CABLES: ZEPHPROD. TELEPHONE: (03) 568 2922

ZEPHYR

AGENCIES:-

ALTEC LANSING
AMPEC ENGINEERING
AUDITEC
BRIMAR VALVES
C.G.S. RESISTANCE
CAMBION
ELECTRONIC DEVELOPMENT SERVICES
E & L INSTRUMENTS
GARRARD
HARTLAND Mfg
J.B.L.
K.E.F.
L.P.S. RESEARCH
MANN COMPONENTS
PRIMO
PIHER
R.C.F.
RADFORD

PRODUCTS

- AMPLIERS
- AMPLIERS MODULES
- AMPLIERS POWER SUPPLIES
- ALARM DEVICES
- BREADBOARDING SYSTEMS
- CABLE
- CONNECTORS-AUDIO
- CONNECTORS-MULTIPIN
- DESIGN SYSTEMS
- DRIVER UNITS HI-FI & P.A.
- FUSEHOLDERS
- GUIDE STRIPS
- HARDWARE
- HORNS HI-FI & P.A.
- INHIBITORS
- INTEGRATED CIRCUIT PACKAGING
- INTERFACING HARDWARE
- INSTRUMENT MODULES
- INSTRUMENT POWER SUPPLIES
- JACKS
- LAMP HOLDERS
- KNOBS
- MATRIX BOARD
- MICROPHONES
- MICRO PROCESSOR SYSTEMS
- MIXER P.A.
- PLUGS
- RACKS (EQUIP)
- RACKS ACCESSORIES
- RESISTORS
- SPEAKERS
- STANDS P.A.
- SUBCONTRACT
- TURNTABLES
- TERMINAL PINS
- WIRE ENAMEL
- WIRING FACILITIES

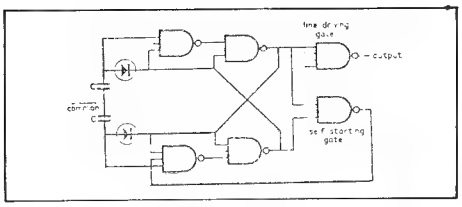


FIGURE 2

tional circuit of each multivibrator in the original circuit and Fig. 2 is the functional circiut of a "self-starting" unit that could be used. One of the advantages of the original circuit is that the whole circuit can be built around a 25c IC. Both these circuits are taken from a TTL Application Book published some years ago by Philips.

Omissions from the circuit diagram in the December issue are the designation of an IC (MC 1496) and that pin 10 of that IC should be connected to the —5.1 volt rail.

Rodney A. J. Reynolds VK3AAR

NEW NOVICE OPERATOR

Victoria's first novice operator, Phillip Harden VK3NAA, operating his new transceiver. Phillip is active on 80, 15 and 11 metres.

PHIL VK3NAA USING A FT301

MOBILE WITH FT75B

TECHNICAL TIPS – CB STYLE

D. S. Down VK5

Dedicated to:

The many radiating, spuriating, and nauseating illegal users of the "27 MHz Band", without whose untiring efforts, co-operation, excessive on-air time, and thorough lack of knowledge in the subject of Radio Communications, this would not have been possible.

Introduction:

The following pearls of wisdom are repeated as copied "off air". In the interest of furthering experimentation in Radio at the higher HF level, it is requested that selfishness does not prevail — SHARE the benefit of the extra knowledge you are about to acquire with others who may be blundering along aimlessly whilst adhering to conventional theory, and especially anyone you know who is studying for any Radio-type exams.

Tip:

1. "I've got hold of an old Army tank transmitter and receiver. It's 24 volts but I'm having the coils professionally rewound to change the circuit impedance to 27 Megs."
2. "Using a homebrew helical whip here mate. When I first made it for going mobile, I put it inside the boot to avoid detection, but it didn't work too good, so I've got it on the guard now."
3. "A five-eighth helical whip on a car roof acts like a panoramic reflector."
4. On hearing local diathermy activate near 27035 kHz, one op to another: "There goes that laser from WRE again."
5. On hearing high speed CW on 27035 kHz (VK5 amateur testing keyer) First op: "I wonder what that is breaking up on a carrier?"
   First op: "I wonder what that is breaking up on a carrier?"
   Second op: "Probably Telecom trying to DF us, but they can't because we haven't got CW fitted on our rigs. On the other hand, it might be one of the VK boys practising his morse. I don't think it would be Telecom or VNA5 practising because they don't need to."
6. One op ashore to another using hand-phone from boat off Glenelg: "If you want to improve the signal strength from your hand-phone, grab a bit of wire, plug one end into your aerial socket and hang the other end into the water so you turn the sea into a ground plane antenna. Should work good."
7. "The PMG and Telecom have ordered new snooping gear which takes photos of your transmissions, but it only takes one. Be another waste of our taxes because by the time they get the photos back, we'll be long gone."
   Second op: "Yeah, but they might have got one of those Polaroid things."
   First op: "Yeah — I didn't think of that. So I'm going QRT in case they're on."
8. "The VK boys use 100 watts of power. Some of them use more if they are using skip licences."
9. "I'm running a 6 channel Realistic into a 5 watt helical whip."
10. "I'm going to get a Ringo or Super maxim whip which will give me 4.8 dB gain, and if I feed it with coax I should get another 5 dB."
11. "The reason more of us are going SSB is because with SSB you get more bandwidth per frequency."
12. "As far as I know, the synthesiser mixes your AM and SSB to give more frequencies. That's as far as I've read so far, but when I've done some more, I'll pass it on."
13. Experienced (?) CB-er assisting newcomer during his first QSO and with brand new rig straight from carton: "The DX button, yeah, well if you want to work local up to about a mile, don't press it, but if you do press it, you'll bring on the skip and you won't do any good local."
14. "Glad I joined the CB club. It's a nice feeling to know you have a legitimate callsign at last."
15. One mobile op (stationary mobile) to another when first op jammed by VK5 on CW: "There goes that bad high tension from the light here — it's hard to tell the difference between high tension and CW these days. There's a lot of one and not much of the other."
16. "I'm going to fit a relay to my whip so I can hear while I transmit."
17. "I wish that b——— button pusher would pack it up, it's blokes like that who get us legitimate operators a bad name with the RIs."
18. "Don't give your 10^0 (location) he QSY to 14 and give it on SSB so the RIs don't hear." Second op: "Upper or lower sideband?" First op: "Upper." Second op: "Was that channel 14 come on?" First op: "1004." Second op: "1004, we're gone."
19. First op: "What's it mean about dBs with an aerial, come on?"
    Second op: "It's to do with gain — if you use more than one aerial you get more gain."
    First op: "1004. What's gain?"
    Second op: "I'm not sure."
20. Two ops arranging an eyeball QSO. First op: "What colour vehicle am I looking for, come on?"
    Second op: "I won't give that over the air for obvious reasons, but my rego number is R———." (Actual number given.)

Conclusion:

And I thought I was fairly well informed????? ■

Sideband Electronics Sales

HF TRANSCEIVERS

ASTRO—200 digital solid state 200 W PEP

ATLAS models 210-x 80 to 10 M transceiver inclusive factory installed noise blanker

YAESU MUSEN model FT-101-E AC-DC transceivers 10 to 160 M with speech processor

TRIO KENWOOD model TS-520 AC-DC transceivers 10 to 80 M

TRIO KENWOOD model TS-820—expected shortly.

HF RECEIVERS

DRAKE SSR-1 continuous coverage receiver

YAUSU MUSEN FR6-7. Uses Wadley loop principal

VHF TRANSCEIVERS

ICOM model IC-202 2 M SSB portable transceiver 144-144.4 MHz

ICOM model IC-502 6 M SSB portable transceivers 52-53 MHz

TRIO KENWOOD model TS-700-A FM-AM-CW-SSB transceivers. Full 144-148 MHz coverage, 10-Watt output, VFO controlled, self-contained, AC-DC operation

KYOKUTO 2 M FM 15 W output transceivers with digital read-out and crystal synthesized PLL circuitry now with 800 transmit and 1000 receive channels 5 KHz apart, covers all of 144-148 MHz, receive to 149 MHz. No more crystals to buy. Includes simplex, repeater and anti-repeater operation

NOVICE TRANSCEIVERS 27 MHz

TRAM XL5 super 15-Watt PEP 23 channels AM-SSB with effective noise blanker

PAL. 69 AM, SSB 15-Watt PEP 23 channels

SWR METERS

SINGLE METER
SINGLE METER with power scale 10-100 W
TWIN METER, SWR up to 200 MHz
CRYSTAL FILTER, 9 MHz, similar to FT-200 ones. With carrier crystals
PTT DYNAMIC MICROPHONES, 50 K or 600 ohms. With 4-pin plug fitted

CRYSTALS

For KP-202
Large number for all popular channels to clear

FERRITE-CORE BALUN. Japanese product

HY-GAIN ANTENNAS

14-AVQ 10-40 M verticals 19′ tall
18-AVT-WB 10-80 M verticals 23′ tall
TH3JR 10-15-20 M 3-element Yagi 12′ boom
TH3MK3 10-15-20 M 3-element Yagi 14′ boom
TH6DXX 10-15-20 M 6-element Yagi 24′ boom
TIGER ARRAY 204 BA 20 M 4-element 26′ boom
BN-86 balun

ASAHI MOBILE ANTENNAS

AS-2-DW-E ¼ wave 2 M mobile whip
AS-WW ⅝ wave 2 M mobile whip
AS-GM gutter clip mount with cable and connectors
M-Ring body mount and cap

CUSH CRAFT ANTENNAS

AR-2X Ringo Ranger double ⅝ vertical for 2 M
A147-11 11-element 2 M Yagi
A147-20 combination horizontal vertical 2 M
A144-20 combination Yagi with matching harness for circular polarization

ANTENNA ROTATORS

Model CDR Ham-II for all hf beams except 40 M
Model CDR AR-22 L junior rotator for small beams
KEN model KR-400 for all medium-size hf beams with internal disc brake
KEN model KR-500 for vertical elevation control of satellite tracking
All models rotators come complete with 230-volt AC indicator-control units.
6-conductor cable for KR-400-500
6-conductor cable, smaller size
10-conductor heavy cable for Ham-II

COAX CABLE CONNECTORS

Coax connectors, RG-8 and RG-58 type. Male to male and female joiners
Angle and T connectors
RCA to P1-259 adaptors
Please add cutting and handling cost—$1.

DRAKE W-4 SWR Watt-meter, 0-200 and 0-2000 Watt scales
DRAKE TV-1000 TVI low pass filter
DRAKE TV-3300 TVI low pass filter
DRAKE TV-42 TVI low pass filter, low power
DRAKE MN-2000 matching network
DRAKE MN-4 low power ant. tuner

All prices quoted are net SYDNEY, N.S.W., on cash-with-order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over $100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded. For prompt and economical despatch we use ANSETT air freight and COMET road service.

Sideband Electronics Sales

For personal attention: **24 KURRI STREET, LOFTUS** **OPEN ON SATURDAYS TILL 12 NOON**

P.O. BOX 184, SUTHERLAND, 2232 **TELEPHONE: 521 7573**

PETER SCHULZ, VK2ZXL.

PROJECT AUSTRALIS

David Hull, VK3ZDH

FEBRUARY 1977

OSCAR 6				OSCAR 7			
Date	Orbit No.	Time Z	Long °W	Date	Orbit No.	Time	Long °W
1	19652	01.01	74.60	1	10127	01.06	68.21
2	19664	00.01	59.60	2	10139	00.05	53 09
3	19677	00.56	73.35	3	10152	01.00	66.71
4	19690	01.51	87.10	4	10165	01.54	80.33
5	19702	00.51	72.10	5	10177	00.53	65.21
6	19715	01.46	85.85	6	10190	01.48	78.83
7	19727	00.45	70.85	7	10202	00.47	63.71
8	19740	01.40	84.60	8	10215	01.41	77.33
9	19752	00.40	69.60	9	10227	00.40	62.21
10	19765	01.35	83.35	10	10240	01.35	75.83
11	19777	00.35	68.35	11	10252	00.34	60.71
12	19790	01.30	82.10	12	10265	01.28	74.33
13	19802	00.30	67.10	13	10277	00.28	59.21
14	19815	01.25	80.85	14	10290	01.22	72.83
15	19827	00.25	65.85	15	10302	00.21	57.71
16	19840	01.20	79 60	16	10315	01.16	71.33
17	19852	00.20	64.60	17	10327	00.15	56.21
18	19865	01.15	78.35	18	10340	01.09	69.83
19	19877	00.15	63.35	19	10352	00.08	54.71
20	19890	01 09	77.10	20	10365	01.03	68.33
21	19902	00.09	62.10	21	10377	00.02	53.21
22	19915	01.04	75.85	22	10390	00.56	66.83
23	19927	00.04	60.85	23	10403	01.51	80.45
24	19940	00 59	74.60	24	10415	00.50	65.33
25	19953	01.54	88.35	25	10428	01.44	78.95
26	19965	00.54	73.35	26	10440	00.44	63.83
27	19978	01.49	87.10	27	10453	01.38	77.45
28	19990	00.49	72.10	28	10465	00.37	62.33
29	20003	01.44	85.85	29	10478	01.31	75.95

MARCH 1977

OSCAR 6				OSCAR 7			
1	20015	00.44	70.85	1	10490	00.30	59.58
2	20028	01.39	84.60	2	10503	01.25	73.20
3	20040	00.39	69.60	3	10515	00.24	58.08
4	20053	01.34	83.35	4	10528	01.18	71.70
5	20065	00.34	68.35	5	10540	00.18	56.58
6	20078	01.29	82.10	6	10553	01.12	70.20
7	20090	00.28	67.10	7	10565	00.11	55.08
8	20103	01.23	80.85	8	10578	01.05	68.70
9	20115	00.23	65.85	9	10590	00.05	53.58
10	20128	01.18	79.60	10	10603	00.59	67.20
11	20140	00.18	64.60	11	10616	01.53	80.82
12	20153	01.13	78.35	12	10628	00.53	65.70
13	20165	00.13	63.35	13	10641	01.47	79.32
14	20178	01.08	77.10	14	10653	00.46	64.20
15	20190	00.08	62.10	15	10666	01.40	77.82
16	20203	01.03	75 85	16	10678	00.40	62.70
17	20215	00.03	60.85	17	10691	01.34	76.32
18	20228	00.58	74.60	18	10703	00 33	61.20
19	20241	01.53	88.35	19	10716	01.28	74.82
20	20253	00.53	73.35	20	10728	00.27	59.70
21	20266	01.47	87.10	21	10741	01.21	73.32
22	20278	00.47	72.10	22	10753	00.21	58 20
23	20291	01.42	85.85	23	10766	01.15	71.82
24	20303	00.42	70.85	24	10778	00.14	56.70
25	20316	01.37	84.60	25	10791	01.08	70.32
26	20328	00.37	69.60	26	10803	00.08	55.20
27	20341	01.32	83.35	27	10816	01 02	68.82
28	20353	00.32	68.35	28	10828	00 01	53.70
29	20366	01.27	82.10	29	10841	00.56	67.32
30	20378	00.27	67.10	30	10854	01.50	80.94
31	20391	01.22	80.85	31	10866	00.49	65 82

Amsat has announced two target dates for future satellites:—

1. AOD June '77.
2. Phase III December '79.

Thus it seems that Oscar 8 will be another low altitude short range satellite similar to Oscars 6 and 7. This news was somewhat disappointing to Project Australis as it was hoped that 8 would provide an increased range for VK satellite users and effort expended on another low altitude satellite must detract from the Phase III program. However, the importance of the ARRL schools program is recognised and the need for a continuing commitment to this will be met by AOD. It is hoped that in future programs will adhere more closely to the decisions taken at the **international** conferences and not be subject to post-conference ARRL pressure. ■

AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Crafers SA, 5152

EU - DX - D (GERMANY)

1. The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
2. The award is an annual one and contacts made between 0000 1st January and 2400 31st December are valid for that year. The first year of issue was 1964 and contacts are valid from that year.
3. QSL cards must be submitted with the application.
4. Awards are issued for all CW, all telephony, 2 x SSB and mixed modes. The "mixed modes" award requires that at least 30 per cent of the contacts are on a mode different from the other 70 per cent contacts, e.g. 70 per cent on CW and 30 per cent on 2 x SSB.
5. The fee for the award is DM4, 10 IRC or equivalent and stickers are DM 0.80, 2 IRC or equivalent.
6. The EU-DX-D Awards Manager will provide application forms and a country list for 1 IRC.
7. The address for applications is:

   Walter Geyrhalter DL3RK
   Post Box 262
   D-895 Kaufbeuren
   Fed Rep of Germany.

Rules: Each country, which may only be contacted once per year, counts as ONE point, except on 3.5 and 1.8 MHz where each country counts as TWO points. The total points of each calendar year may be added together to obtain EU-DX-D 500 (points), for which an honorary label is issued, and for EU-DX-D 1000 (points), for which a trophy is awarded. The calendar years do NOT have to be consecutive.

Requirements: A minimum of 50 points are required in any one calendar year. 20 of these points are required from European contacts and 30 from non-European contacts. Stickers are issued for each additional 10 points in the ratio of 4 European contacts and 6 non-European.

Countries List:

CT1	IP	SV Crete
CT2	IS	SV Rhodes
DL/DJ/DK/DM	IT	TA eu part
EA	JW	TF
EA6	JX	UA
EI	LA	UA FJL
EI0	LA Bear Is.	UB
F	LX	UC
FC	LZ	UN
G	OE	UO
GC Jersey	OH	UP
GC Guernsey	OJ0	UQ
GD	OK	UR
GI	ON	YO
GM	OY	YU
GM Shetlands	OZ	ZA
GM Orkneys	OZ Bornholm	ZB2
GW	PA	3A2
HA	C/31 PX	4U1
HB	SM	9A1
HB0	SM1	9H1
HV	SP	
I	SV	

Countries outside Europe:
ARRL country list plus the following addition —
MP4D Das Island
UA0Y Tannu Tuva
VO Newfoundland and Labrador
VK7 Tasmania
VS9 Socotra Island
YN0 Corn Island
ZS3 Walfishbay

WALA AWARD — NORWAY

1. The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
2. Contacts on and after 1-1-1950 are valid.
3. Do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager of a National Society.
4. The award is issued for all CW, all phone or mixed modes.
5. The fee for the award is 5 crowns or 10 IRC.
6. The address for applications is:

   NRRL Awards Manager,
   Post Box 59,
   N-3251 Larvik,
   Norway.

Rules: Contacts with JW Svalbard, JW Bear Island and JX Jan Mayen count for the award.

Requirements: Stations must have confirmed contacts with 20 different LA (JW JX) stations on any bands with at least SIX located north of the Arctic Circle. The QTH must be indicated on the QSL card. ■

LARA

Ladies Amateur Radio Association

As we are now a month into the New Year, it may seem inappropriate to greet members with best wishes for the year but I am going to anyway. Lack of notes from LARA last month was due to the intrusion of academic priorities into my somewhat crowded schedule and we were too late for publication. Sorry.

With the new year it seems appropriate to introduce LARA to those who may not have heard of us. As our fairly self-explanatory title suggests, we are a group of YL's who are interested in some (or all) aspects of amateur radio. Any YL can join and levels of technical expertise amongst us range from extensive knowhow to cheerful ignorance. Those in the latter group, like me, are given mutual help in learning about amateur radio and so LARA members will be sitting exams this month. Best of luck to these intrepid adventurers! The rest of the time we manage to have fun and liven up the amateur scene. Members of the group have taken part in conventions and field days of other groups and also in the more humdrum field of Institute Organisation (and hard work).

Within LARA we keep in touch with a "regular" newsletter (regularity varying from once in six months to twice in two) and 80m skeds, weekly. Monthly, or so, meetings are held in some States and annual general meetings once a year, or so. Formalities such as membership enquiries or just getting in touch can be handled by Norma Boyle VK3AYL or Irene Robinson, who can be contacted through the Victorian Division of the Institute. For those just interested in hearing about LARA we can usually be found in the pages of this magazine, if the creative process can be sufficiently co-ordinated to get our efforts in on time. ■

CONTESTS

Kevin Phillips, VK3AUQ

Box 67, East Melbourne, 3002

CONTEST CALENDAR

February

5/6	ARRL DX Phone contest
12/13	*JOHN MOYLE MEMORIAL NATIONAL FIELD DAY
19/20	ARRL DX CW contest
19/20	YL - OM Phone contest
26/27	French Phone contest

March

5/6	ARRL DX Phone contest
5/6	YL - OM CW contest
19/20	ARRL DX CW contest
26/27	CQ WW WPX SSB contest
26/28	BARTG Spring RTTY contest

April

12/13	DX YL to W/VE YL CW contest
16/17	ARRL CD CW Party
23/24	ARRL CD Phone Party
26/27	DX YL to W/VE YL Phone contest

* Indicates a contest for the Contest Champion Trophy.

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY 1977

This contest is on the week-end of 12/13 February. It is the second contest counting towards the 1977 Contest Champion Trophy, although only single operators will be eligible for trophy points. There is something for most people in this contest, whether they be a club group, single op., VHFer, home station, or SWL. So, if you have not already done so, dust the cobwebs off your rig, turn it on,

and work all your old friends and make a few new ones, too. And please submit logs to P.O. Box 67, East Melbourne.

BARTG SPRING RTTY CONTEST

Starts at 0200 GMT on Saturday, March 26, and finishes at 0200 GMT on Monday, March 28 1977. No more than 30 hours of operating is permitted. The 18 hour non-operating period may be taken at any time, but must be at least 3 hours at a time. Times on and off the air must be summarised on the log and score sheets. Bands used are the 3.5, 7, 14, 21, and 28 MHz Amateur bands. Stations may be worked only once per band. Countries will be taken as the ARRL Countries list with, in addition, each W/K and VE/VO call area counting as a separate country.

Exchange (a) the time GMT as a four figure number, and (b) RST and message number, consisting of a 3 figure group starting at 001 for the first contact made. Points are 2 for each 2 way RTTY contact within one's own country, and 10 for others. Bonus points of 200 will be awarded for each country worked (includes own country), claimed once per band. Continents may be claimed once only.

Scoring is (a) QSO points times total countries, and (b) total country points times bonus points (200), times the number of continents worked. Add (a) and (b) together for the final score.

Logs must be received by May 31st 1977. Use a separate log for each band. Logs must contain date, time GMT, call sign of station worked, RST and QSO number sent, RST and QSO number received, and exchange points claimed.

Logs should be sent to Ted Double, G8CDW, Linden Gardens, ENFIELD, Middlesex, England EN1 4DX. ■

COMMONWEALTH CONTEST 1977

COMMONWEALTH CONTEST 1977

Australian participation in this contest has increased greatly over the last couple of years and 34 VKs sent in entries for the 1976 contest in which VK3MR took out 3rd place world-wide. (Results AR December '76.)

It is felt that the above 34 could easily be doubled if some of the many regular RD operators would lend a hand. The scoring system is a good one — chasing bonus points apart from contact points is a great interest in itself (a key also to success), and with the recent improvement in conditions on 10 and 15 metres, there is more scope in the bonus area than for years past.

Try it, you'll like it!

TIME

1200 GMT Saturday, 12th March, to
1200 GMT Sunday, 13th March.

MODE

CW only 3.5 to 28 MHz. Call is CQ BERU!

Eligible entrants are radio amateurs licensed to operate in British Commonwealth call areas. In this region, Lord Howe VK2, Willis VK4, Christmas VK9, Cocos VK9, Norfolk VK9, Heard VK0, Macquarie VK0, and Australian Antarctica, as well as VK1-8, are all separate contest areas.

Two trophies have been presented for competition between VK stations — a silver medallion for the highest VK scorer in the official RSGB results and a bronze medallion for a middle placed VK scorer based on total VK entries divided by two, that is for 34 entries, to 17th placing, for 53 entries, to 27th placing. Last year's trophy winners were VK3MR and VK5KL.

SCORING: 5 points for contest exchange, plus 20 bonus points for 1st, 2nd and 3rd contact with each call area other than one's own (there are 111 in all, with G, GW, GC, etc., counting as a single area) — exotic prefixes, A2, C6, 8P, 9L, etc., are the rule rather than the exception.

LOGS: Separate logs are required for each band showing columns — 1. Date and time GMT; 2. Station worked; 3. NR sent; 4, NR received; 5. Band; 6. Leave blank; 7. Contact points claimed; 8. Bonus points.

Each band log should be separately totalled and should include, at the end, a check list of areas worked on the band. Separate band totals should be added together and the total claimed score entered on a cover sheet, giving particulars of station, QTH, equipment, power, and a declaration that the rules and spirit of the contest have been observed.

Entries may be single or multi-band. Single band entries should claim entries on one band only, but submit details of contacts on other bands for checking only. Entries should be addressed to

D. J. Andrews G3MXJ,
18 Downsview Crescent, Uckfield,
Sussex, England.

Closing date 16th May 1977 (by airmail, please). ■

AROUND THE TRADE

A letter received from Mr. G. P. Fitzpatrick (Network Engineering and Building Company) states that they hold quantities of Teletype Model 15 RTTY machines and are the main source of these machines in VK. These machines are given a pre-sale check and set to 50 baud. Mr. Fitzpatrick is seeking information on electronic speed controls for RTTY machines. He also suggests that the company may offer a Teletype machine as a competition prize.

Write to P.O. Box 99, Pyrmont, N.S.W., 2009. ■

AMATEUR COMMUNICATIONS ADVANCES (P.O. Box 57, Rozelle 2039) advise that they have available RISTON pre-coated pc boards. Riston is a dry photo-sensitive polymer film. A negative of a pc board is placed over the Riston coated board which is then exposed to sunlight or a UV source. This causes the Riston to harden. The unwanted resist is removed by a developer and the board etched. The board is then cleaned in acetone. One advantage claimed for Riston is its insensitivity to over-exposure. ■

PROJECT AUSTRALIS

IARU NEWS

From Region 2 news of Nov. '76 comes news that during Sept. '76 IARU President Noel Eaton VE3CJ and Region 2 President Vic Clark W4KFC visited Malta after the all Region Conference in Geneva then onwards to Eastern Europe, where they held conferences with officials of the Radio Sports Federation in Moscow and the equivalents in Rumania, Hungary and Bulgaria. Wide-ranging discussions were held at each point regarding plans for WARC '79, growth and development of the world-wide amateur radio service, and means for achieving strengthened liaison among the IARU member societies of the world.

Each of the Eastern European societies had been represented at the IARU Region 1 conference in Warsaw last year and each has indicated support of plans to seek exclusive and additional world-wide amateur frequencies.

Amateur radio was reported as thriving and growing in each of the countries visited, with Government encouragement and support being provided in the form of electronic components and equipment, society headquarters and club station facilities, as well as national recognition of accomplishments in amateur radio activities and competitions.

Characterised as a "radiosport", amateur radio in the Eastern European countries is valued both for its technical training attributes and the opportunities which are provided for developing operational skills through on-the-air contests, fox hunts and code speed competitions.

The amateur radio service is growing at a rate of from six to ten per cent per year in the countries visited, with increasing interest being exhibited in more exotic transmission modes such as SSTV and satellite operation.

Amateur radio in these countries makes effective use of club stations in which newer amateurs are provided with supervised on-the-air training activity. A large part of the population lives in high rise apartments in which antenna possibilities are limited by the hundreds of TV antennas that sprout from the roofs, so the ratio of club to individual stations tends to be greater than in western countries.

In certain countries a beginner is given the parts and materials to construct his equipment and a six months period in which to complete the job, as a prerequisite to becoming an amateur.

News from a reliable correspondent in Africa indicates that amateur radio appears to have been banned in Malawi from about mid-1976. The reasons are not known. He also says there are now no radio amateurs operating from Angola, Zaire, Mozambique, Tanzania, Zanzibar, Rwanda, Burundi and Somalia. It is presumed that none will be operating from Uganda, Ethiopia and Djibouti (Afars and Issas) but this is conjecture. ■

REPEATERS

Ken Jewell, VK3ZNJ
Peter Mill, VK3ZPP

The problems of keeping a column going are not made any easier by the complete lack of information and this leads me to my opening remarks. In this column we print only the facts that are supplied to us by the repeater groups and not grapevine data that is freely given away by so-called informed people. Those of you who have purchased the Electronics Australia Yearbook should carefully study their repeater listings and compare them with those that have appeared in AR. A large number of discrepancies will be noted and unfortunately people who believe that it is correct will act on that information. A question was asked by the South Australian Repeater Committee, "What happened to our communication pipeline?" Well, that is a good question. If nothing goes in then nothing comes out, and after 10 months we have found out about all their repeaters in that State. Also if any committee in each Division wants to know what is happening on the repeater scene then we suggest they contact their Federal Councillor who receives copies of the Minutes of the FRC meetings.

QUEENSLAND NEWS

My thanks to George VK4ZMG for his letter bringing me up to date on the repeaters in his State. In Queensland there are now 9 repeaters in operation, or in the planning stage, both VHF and UHF, and an updated listing will appear at the end of the column. Since our last listing the Townsville, Ipswich, and Toowoomba repeaters have advised that they are operational, but there are no details to hand about the equipment or operational features. Could someone please assist?

VICTORIAN NEWS

In the continuing saga of the Mt. Macedon repeater, which is threatening to hold the record for the longest times coming, they now have the receiver to go with the site, tower and antennas. When Peter VK3ZPP sorts it out there is only the Tx and Controls to go. Perhaps by Christmas? The Ballarat gang have moved their repeater to a new site on Mt. Buningyong and are getting coverage up to 80 kms. Their licence application is with the P. & T. Department and should be through soon. Up in the north-east the Mt. Big Ben repeater is not too far away as the site has been completed and the tower and antennas are well on the way. At Geelong we have been suffering with our seasonal problems which I hope has been fixed again when you read this. The Country Fire Authority have a radio which is taken up to Mt. Anakie each summer. This set has a local oscillator chain that has an output 4 kHz away from the input of the repeater, causing the repeater to lock on and time out. The UHF repeaters in Melbourne are both in a state of flux with the experimental station of the 70 cm Group VK3RAD located at Doncaster giving a very limited range. A new site is being investigated. Because the 70 cm group was given the prime national repeater frequency as they requested, the service repeater for Melbourne will be on a secondary channel which is used elsewhere in Australia. At the time of writing the equipment for the Melbourne service repeater was being prepared and the keyer for VK3RMU was needed to complete the installation. Finally, the annual State repeater meeting is to be held soon and agenda items are invited to be submitted to the secretary, VK3AAA, 57 Race Street, Bendigo, Vic. 3550.

SOUTH AUSTRALIAN NEWS

The mid-north repeater near Pt. Pirie, VK5RMN, is now on the air after a battle over the site with 3 government departments for 2 years. The equipment is all home brew exept for the Tx

exciter which is a Phillips 1680. The final is 2N5590 at 10 watts output. The receiver is a VK5ZHF design and a diplexer is used to feed the station to the Hustler G6-144 6 dB gain antenna. The operating conditions of this repeater, such as time out and identification, are similar to those of the Adelaide repeaters. The second Adelaide repeater VK5RHO was originally planned to operate on channel 46 but due to a problem with harmonics from a commercial site, channel 45 is being used. Once a significant number of stations have been equipped with the new channel, VK5RAD will be taken off the air for a face lift. Perhaps by the time you read this the Mt. Gambier repeater will be on the air as it was originally planned to be on for the convention last year. ■

QUEENSLAND REPEATERS

CALLSIGN	Ch	LOCATION OR SERVICE AREA	TYPE OF IDENT	RANGE	PROJECT OFF.
OPERATIONAL					
VK4RBN	48	Brisbane/Mt. Glorious	Audible	80 km	VK4ZMG
VK4RGC	42	Gold Coast/Mt. Tamborine	Audible	60 km	VK4ZDA
VK4RAR	42	Rockhampton/Mt. Archer	Audible	80 km	VK4MM
VK4RAT	42	Townsville/Mt. Stuart	Audible	75 km	VK4XZ
VK4RDD	44	Toowoomba	Audible	80 km	VK4ND
VK4RAI	46	Ipswich	Audible	60 km	VK4CCR
VK4RGC	322/822	Gold Cost/Mt. Tamborine	Audible	?	VK4ZDA
PROPOSED					
VK4RBU	44	Bundaberg/Mt. Goomamemah	Audible	?	VK4GI
VK4RBC	352/852	Brisbane	Audible	30 km	VK4ADC

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

35 Florabella Street,
Warrimoo, N.S.W. 2775.
30-11-76.

The Editor,
Dear Sir,

I really think it is time I voiced my feelings about this so-called CB Radio in Australia.

After listening to 27 MHz last Sunday, I was appalled to hear the large volume of so-called CB activity. There is absolutely no doubt in my mind that this activity is not CB. Far from it indeed. Let there be no qualms about the fact that these operators are unlicensed amateurs with all the privileges of the Novice on 27 MHz. Certainly they are not operating as CB-ers. Listening to their talk it is hard to distinguish them from the real hams, the only difference in many cases being their phoney call signs; and the activity is not just males, quite a good proportion of girls were heard working their own stations. What is really galling is their apparent freedom to work DX, many with home built beam antennas. I heard an enormous number of VK2's working VK6's, VK5's VK3's, VK4's and some boasting of their DX contacts overseas, into Europe, ZL and VK7 and Japan. I like to work other legal hams on 27 MHz myself and I also like to work and encourage the Novices who appear on 27 MHz, but I was shocked to hear Novices, both CW and phone being severely interfered with by very heavy QRM from the pirates. They run 5 and 7's to 5 and 9's signal strength and 5/5 to 5/7 on DX in some cases.

I understand the WIA has no real policy regarding CB activity in Australia. This really rocks me. I think too many influential people who should sound a louder, sterner, more discenting voice, are taking too soft a line against illegal CB. Get cracking and be more energetic and active in trying to put CB, if it is to flourish, in its right place. Try even, a few articles in the newspapers!

Another disturbing note was realised when I walked into two large electronics retail stores in Sydney recently and witnessed the blantant way CB equipment is being sold over the counters.

Many real hams have voiced their concern over the ham bands and it is now time to act before we all, WIA included, regret out indolence or our tolerance, or whatever it might be called.

Frank Wright VK2BZ. ■

The Editor,
Amateur Radio,
Dear Sir,

On behalf of a large number of members of the WA VHF Group, I express concern at the new rules for the Ross Hull VHF Contest 1976-77. The rules deny any recognition to the challenges associated with frequency and distance.

It was my understanding that one of the main purposes of this contest was to encourage activity on all VHF/UHF bands; to have amateurs improve the technical performance of their equipment and to explore propogation characteristics. The scoring system announced without warning does not give all amateurs a chance to participate with the thought of winning.

The VK6 call area is the largest in Australia, and the minimum distance for any contact to a new call area from the south-west of this State is over 2000 km — contrast this with all other VK call areas!

VK6 amateurs will be there to work DX — but as for the contest — it's another reason to secede! Please restore incentive for acitvity on higher frequency bands and give a bonus for distance worked — not according to political boundaries of of call areas!

W. J. Howse VK6KZ on behalf of: 6MR, 6AU, 6ZDY, 6ZKO, 6ZGG, 6ZFY, 6SS, 6ZBW, 6BY, 6CU, 6KZ, 6ZKV, 6ZED, 6ZAC, 6ZKF, 6IQ, 6ZDN, 6ZAF, 6ZEG, 6YL, 6PD, 6TZ, 6ZDU, 6ZIS, 6ZIH, 6ZFO, 6DS, 6ZDO, 6ZBE, 6WG, 6WH, 6VF. ■

The Editor,
Amateur Radio,
Dear Sir,

The following account of a recent experience might provide food for thought in the current controversy over CB radio.

I walked into the store of a well known supplier of electronic gear and stood waiting to be served by a salesman who was already serving a rather scruffy looking youth. On the counter between them, there was an imposing-looking range of gear consisting of a so-called CB transceiver, a mobile antennae and base to suit, and co-ax cable and plugs. The customer was in the process of paying over money for the gear. I overheard the following conversation between the salesman (S) and the customer (C):—

S: "You will get a lot of fun out of this gear. Everybody's in it now."
C: "Yes. A lot of my mates are in it. While I'm here, could you tell me how to hook it all up?"
S: "You won't have any trouble. You can mount the transceiver anywhere in your car where you can get to it easily. Then take this cable through and connect it to your battery. Then mount the antennae on the car. It would be best on the top of the roof. Then run this cable down into the car and connect it up to the transceiver with this plug."
C: "How do I connect this plug to the cable? Does it just screw on like a power point?"
S: "It's a bit more complicated than that. One of your friends would probably be able to show you how to do it. If not, you could bring it back in and we would do the job for you."
C: "How do I work the set?"
S: "It's very easy. You just turn this switch on to one of the channels. Some of these channels are for America, so you won't get anything on them, but just switch it around until you hear someone talking, and then you can talk back to them."
C: "What do I say?"
S: "Just talk the way you usually do to your friends. Be sure to press this switch on the side of the microphone when you talk, otherwise they won't hear you."
C: "I'm glad you told me that. What do I do if I can't hear anyone?"
S: "Just say CQ followed by your call."
C: "What's a call?"
S: "That's your call sign. If you don't have a licenced call sign you just make one up for yourself. If you listen to other people talking, you'll see how it's done."
C: "I don't have a licence, so I'll have to make one up. Is there anything else I should know?"
S: "No. You'll pick it up as you go along. After you've listened to others for about an hour you'll see how it's done. By the way, when you switch to this channel here, you might hear a beep beep now and then. Don't take any notice of that. It will only be one of the hospitals. They won't worry you too much, and if you talk loudly enough you'll get through. If there is too much beeping, just switch to another channel."

At this point I pocketed my meagre list of required components and walked out in disgust. As one who had a long hard grind with the AOCP, not to mention the inordinate delays in the conduct of examinations and the marking of papers, I did not think it would be wise to trust myself to deal with the salesman in the frame of mind which I had developed during the course of the overheard conversation.

Fred Herron VK2BHE.
President, Summerland Radio Club.

The Editor,
Dear Sir,

I herewith protest most emphatically concerning the insertion in December 1976 AR of the advertisement by Audio Telex Communications Pty. Ltd., which faces page 11.

I draw your attention to the fact that this CB advertisement has no place in AR, regardless of the income to the WIA which it provided.

There is such a thing as tainted money and this advertisement which is purely CB should not have been accepted

This probe by the CB industry and perhaps by the Federal Executive is not going unchallenged.

Should this practice continue then reaction and retribution will surely follow.

Advertisement of CB equipment as suitable for Novice use, and so stated, in combination with items of specialized amateur VHF and HF equipment are tolerable. However, advertisements relating solely to CB equipment and without the CB references deleted, are not, in my opinion, admissible in AR, regardless of loss of revenue.

Please note that my concern is with the principles and ethics of advertising involved here and in no way is any criticism of the item of equipment, its suitability for amateur use, or its technical specification implied or should be inferred.

Finally, may I stress this point, that any repetition of 100 per cent CB advertising in AR will inevitably require a re-evaluation of the int and integrity of the entire Federal Executive the WIA by the membership.

Sincerely yours,
George Harmer VK4XW, MWIA, Qld. Division ■

The Editor,
Dear Sir,

My recent letter to the editor on morse code has brought no response that I am aware of in the various groups who send slow morse tuition to would-be amateurs. There are a few other points perhaps that need to be stressed as well as those previously expressed.

A variety of tuitional groups conducting theory classes for the amateur and novice have approached the Postal and Telecommunications Department for syllabuses for these exams. Why? I can only assume so that they then know exactly what to teach the prospective amateurs the things they are likely to be asked in the examination.

However, apparently this query has never been presented in relation to how the morse code is to be sent at the exams. Strange, you would think tutors would want to prepare their students so that they would PASS the morse examination. After all, isn't the name of the game to get as many students through the examinations whether the subject be theory, regulations or morse?

This hysterical attitude on the part of many tutors and other so-called experts that the morse

ELECTRONIC ENTHUSIASTS EMPORIUM

ITEMS OF INTEREST TO HOMEBREWERS. See current issue "Electronics Today International" for more detailed listing of components.

TRANSISTORS

BC107	.19
BC108	.19
BC109	.19
BFY50	.75
MPF102	.55
MPF103	.85
MPF104	1 10
MPF105	.65
MPF106	6.0
MPF131/121	1.30
2N706A	.95
2N918	1 60
2N2222A	95
2N2905	.95
2N3638A	.50
2N3642	.45
2N3819	1.25
2N5245	.65
2N5590	7.75
2N5591	9 40
2N6084	17 50
40637A	2.85
40673	1.65
40841	1 50
MRF603	7 90

74 SERIES TTL

74S00	1.15
74S74	1.80
74S112	2 50
74S196	5.95
7400	39
7404	.39
7474	.69
7489	3 90
7490	65
74121	75
74145	1.95
9001	1.50
9368	3 20
74C90	1 95
82S90	5.95
9SH90	P O.A
11C90	P O A

PC BOARD

FIBREGLASS —

4" x 3" S S.	.75
6" x 4" S S	1.20
8" x 3" S.S	1.20
6" x 6" S S.	1 60
8" x 6" S.S.	2 20
12" x 4" D.S.	2 90
12 " x 12" D.S.	6.00
6M CONVERT	2.50
2M CONVERT	2.50

LINEARS

CA3018	3 50
CA3028A	1 80
CA3089/LM3089	2.90
CA3130/T	1.85
CA3140/T	1.65
LM370	2 95
LM373	4.70
LM555	95
LM556	2.75
LM562B	9 50
LM565	2 90
LM567	3.50
LM723	.95
LM741	.49
LM1496	1.80
LM3900	1.75
MC1350	1 60
MC1351	1.95
MC1468	6.50
MC1648P	P.O A.
MC7805	2.50
MC7812	2.50
MC7815	2.50
SG3009K	1.95
TAA300	2.90
TBA651	3.90
UA720	3.80
ZN414	3 95

DIP SOCKETS

8 PIN	38
14 PIN	39
16 PIN	45
24 PIN	.78
40 PIN	1.25

TOROIDS, etc.

IRRESPECTIVE OF MIX

T-12	.70
T-25	.75
T-37	.80
T-50	85
T-68	.95

COIL FORMS

NEOS.D772/1	20
5027/6PLB	20
7100CAN	20
5200/8PLB	25
7300CAN	25
F16 or F29	.12

DIODES

ZENERS 400MW	35
ZENERS 1 3W	72
BA102	.60
BB105G	.85
EM402	.20
EM404	.20
EM408	35
IN914	.10
MV1401	P.O A
OA47	.45
OA90	.25
OA91	.25
PA40	4.90
2530	.95
2530R	.95

MISCELLANEOUS

SO239	1.50
PL259	1.50
BNC Plug	2.30
BNC Sockets	1.60
7 Seg Displays	2 50
Miller Coils	Indent
A R R L. Publications	See E.T.I. or write

BOXES

108 x 108 x 50	2.50
216 x 108 x 50	3.75

INSTRUMENT BOX

160 x 160 x 70 (Black/White)	5 90

12 OR 24-HR. CLOCK

MA1002 Module. Transformer. Bits. Pieces Data. but not case (specify version)	27.95

VALVES

6DQ5	7.25
6GK6	4.95
12BY7A	1.95
OD3	P.O.A.
7360	7.65
*QQEO6-40	34 90
*6146	8.90
*6146B	9.70
*6939	16 95
*4-125A	63 90
*4-250A	71.90
*6JS6	P O A

* Indent only

SEND NO MONEY

Where QTHR, simply order by mail or phone and pay on Invoice. No charges. No Post/Pack under 500 g (1 lb.)

SHOPS 2 & 3, POST OFFICE ARCADE, 7-10 JOYCE STREET, PENDLE HILL, N.S.W. 2145 — TELEPHONE 636-6222

MAIL: P.O. BOX 33, PENDLE HILL, N.S.W., 2145

Mon, Tues, Wed. 8.30-5.30, Thurs 8.30-7.30, Fri 8.30-6.00, Sat 8.00-12.30.

PLENTY OF PARKING AT REAR — DON'T FORGET P/P

When the other operator sends

Q.S.L.

MAKE SURE YOU CAN

HIGH CLASS CARDS. On yellow, light blue, light green or coffee Krome-Kote card.
Card shows map of Australia with State boundaries.

YOUR CALLSIGN is in red letters 20 mm high. Main text and map outline in black.

CARD SIZE 145 x 85 mm. Australian Post preferred size.

PRICE PER HUNDRED CARDS

Minimum Order 500

500-999 **$3.50** per hundred

1000 and over **$3.00** per hundred

Postage and packing for 500-999 please add 75c. For 1000 plus, add $1.00.

Print call sign, name and address. Send cash with order. No C.O.D.

To

G. LINTHORNE VK2GL

20 THOMPSON STREET, CHARLESTOWN, N.S.W. 2290

Regrettably prices may increase without notice due to devaluation.

must be their own particular brand is a bit like saying you're going to drive on the right side of the road in a country where the law says that all vehicles must stay on the left side of the road. Sooner or later you will hit or be hit by someone who is abiding by the road law, you could be dead unlucky. Is it therefore not unreasonable to expect that there is some recognised morse standard — there is and it is specified exactly in the International Telecommunications Union Telegraphy Regulations. Australia, along with most of the countries of the world, is a signatory to the ITU. The morse code characters and spacing is specified as follows where the dot is considered the unit of character length:—

The length of the space between elements of a letter equals a dot, a dash equals 3 dots, the space between letters equals 3 dots, the space between words equals 7 dots.

Many instructors say that the characters should be sent fast with big gaps and that as the speed is increased the spacing between letters and words is reduced. That is all very fine if you are being taught morse for the Services or such like where they train you for a specified terminal speed. But for amateur purposes what speed will be your terminal speed 5 wpm, 10 wpm, 30 wpm? Perhaps the terminal speed should be 5 wpm for Novice with characters sent at 5 wpm rate when you are sending 2 wpm and gradually reduce the spacing until 5 wpm is being sent. 10 wpm more terminal speed could be sent at 10 wpm character rate at 6 wpm, gradually reducing the spacing until 10 wpm is reached.

To would-be full call amateurs, and novices, I suggest that it is a waste of the tutors' time, your time and the examiners' time if you are taught on non-standard morse — after all, you do want to pass that pesky more exam. If your tutor sends the wrong morse, change tutor or ask him to send ITU morse. Whether the morse should be ITU standard or not is immaterial, the point of the exercise is to pass the exam and if it is sent ITU standard, as I gather it is, learn it to that standard. One final point, stop whingeing and griping about the morse exams, if you do some practice and will yourself to pass, you will.

Yours faithfully,
Rodney Champness VK3UG. ■

The Editor,
Dear Sir,
I would like to comment on Chess via Amateur Radio AR January '77.

To play or Not to play? That is the question.

To play? — Back in August '72, VK9GN, Gene in Ukaraumpa called CQ Chess CQ . . . on 20 m. Intrigued, I replied and from then on some very enjoyable and challenging times ensued.

Later, Dave VK8DO, Jim VK6JX (Kalgoorlie) and Bruce VK5OR joined in.

Calls from VK, ZL, K, Europe, and Asia were acknowledged, Central Europeans and Russians were most interested as chess is their No. 1 pastime. Gene and I had all the DX we wanted between moves.

On one occasion VK8DO and VK9GN were in session, I tuned just in time as QSB between Darwin and Ukarumpa was making hard copy and stood by relaying moves, 8000 km for each move. Dave and Gene finshed the game.

Not to play? — About mid '74, the axe fell! Bruce and I were playing on 40 m, a good band for VK3 and 5. Some days later I received a notice from our Advisory Committee stating that playing chess on the Amateur Bands was forbidden and that call signs were not given at the required periods.

I assure you, identification was given at the correct time. There were intervals between moves but the frequency was clear. We had to QSY many times to finish the games.

Naturally we abided by the ruling and as not to tempt the wrath of officialdom to descend upon us, went QRT on chess.

There is one thing for sure. I really miss that familiar "Pawn to Echo 4".

73. Len Pearson VK3LP. ■

The Editor,
Dear Sir,
After reading the motion passed by the Moorabbin and District Radio Club (December '76 AR), several thoughts come to mind.

Firstly, why should the amateur service just freely give up its 27 MHz allocation just because some so-called Citizens' Band service would like to have it, so some retailers can line their pockets with the great god "money". If the amateur service freely gives up 27 MHz then why don't we just give away 40 metres as well, after all the commercial intruders won't go away, and what of 15 metres, might as well give 15 up as well, there's not much activity at the moment. Why don't we amateurs just give up all our frequency allocations to any other service that may lay claim to them?

I can't for the life of me see a CB type progressing on to an amateur licence. Surely with the Novice scheme now operating anyone who is "fair dinkum" would study for the Novice licence and not opt for a CB licence.

While I don't oppose the principle of a so-called citizen's band service with its dubious advantages to the community, I do most emphatically object to its establishment in an amateur band.

If such a CB service is needed, then why not establish such a service in a higher part of the frequency spectrum where it could provide a constant short range reliable communications system.

It's about time we stood up and fought to retain our frequency allocations, rather than lying down like "a damp squid" and giving our bands away to any other service that may lay claims to them. If we lose 27 MHz to these poachers, without so much as an argument, then why won't we lose any other band for any other reason to whoever might want it.

Glen Molloy VK2AGM. ■

QSP

PROGRESS

Pat Hawker writing his T.T. column in January '77 Radio Communication has this to say on the subject of how good is good enough —

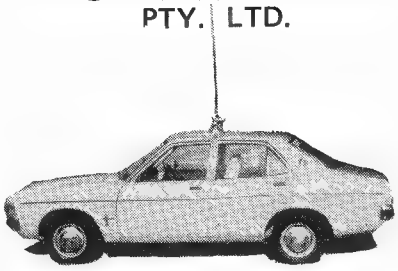
"The other day, reading an excellent and informative article on optimum HF receiver design by Ulrich L. Rohde, DJ2LR ('Ham Radio' October 1976), I found myself thinking 'how good is good enough?' The solid-state techniques described by DJ2LR are basically those which have gradually gained acceptance for the very highest quality professional general-coverage receivers costing thousands of pounds: up-conversion to VHF, roofing as well as selective crystal filters, elliptic filters, etc. While we would certainly not wish to deter anyone from tackling the design and construction of such an advanced receiver (though we still feel that for an HF **amateur-bands** receiver an i.f. of 9 to 10.7 MHz is probably high enough and presents fewer problems) we suspect that only a handful of amateurs could or would complete such a project, although of course many will wish to understand such trends. For many years the electronics of communications equipment has been getting progressively more and more complex and less and less within the economics (and sometimes the understanding) of the average amateur. Yet the competitive nature of amateur operating has encouraged the view that we all need 'optimum' equipment. Sometimes it seems that everyone is having to run faster and faster to stay in the same place; not only ever more complex receivers and transmitters but also all the ancillary equipment to go with them.

Now if an amateur wants to buy a fully-equipped, all-mode, highly-professional station, that is his or her affair; my concern is rather that we need to reassure newcomers that they do not **have** to spend a mint of money to take any sort of active or useful part in the hobby — plus sometimes a worry that the whole hobby may eventually blow itself up by trying to become too professional, at professional prices."

He concludes his remarks with these observation:—

"So, sure; as amateurs we need good equipment; and we need many of the latest techniques. But we also need occasionally to ask ourselves just how good is good enough. If not we risk 'galloping obsolescence' and biting off more than we can chew in seeking 'optimum' equipment. Then again, do we really need to eliminate manual controls and adjustments and human skills in dreaming of running our stations from microprocessors and electronic memories? After all, amateur radio is still a hobby for **humans** — not yet for computers." ■

MOBILE ONE
PTY. LTD.



SPECIALISTS AND CONSULTANTS

Two-Way Radio Communication Systems suitable for Novice Amateur use.

Manufacturers of "The Helical Antenna"

DISTRIBUTORS OF ALL PRODUCTS FOR ANY FUTURE CB SERVICE

Trade Enquiries Welcome

REPRESENTATIVES IN ALL STATES

Further information and list of distributors:

277 VICTORIA ROAD, MARRICKVILLE, N.S.W.

Phone 560 7693 — 39 1395

Postal Address:
P.O. Box 166,
RANDWICK,
N.S.W. 2031

MAKE IT ON 70 cm FROM YOUR MOBILE OR HOME STATION, 2m RIG

NEW RELEASE — TRANSVERTER MODEL MMT432/144

UTILIZING an IF of 144 MHz ★ 10 WATTS DRIVE OR ½ WATT ★ VOX OPERATED

This 432 solid state linear transverter is intended for use with a 144 MHz transceiver to produce a high reliability transceive capability. A 10 watt load and RF sensing network eliminates the need for any ancillary circuitry. A single coaxial connection is all that is required between the transverter and the associated 144 MHz transceiver.

A wide range of applications is offered by this MMT432/114 transverter, which by virtue of its linear mode of operation will enable 144 MHz SSB, FM, AM or CW equipment to be used at 432 MHz.

Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation.

FEATURES: High quality double-sided glass fibre printed board ★ Highly stable zener controlled oscillator stages ★ PIN diode aerial changeover relay with less than 0.2 dB through loss ★ Extremely low noise receive converter, typical 3 dB ★ Separate receive converter output gives independent receiver facility ★ Built in Automatic RF VOX with override facility ★ Built in 10 watt 144 MHz termination, selectable attenuator for ½ watt ★ Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output.

Model MMT432/144 — Price $260

TRANSVERTER MODEL MMT432/28

FEATURING COMBINATION OF A LOW-NOISE RECEIVE CONVERTER AND A LOW-DISTORTION TRANSMIT CONVERTER PRODUCNG A SPURIOUS-FREE LINEAR SSB SIGNAL, PARTICULARLY WHERE HIGH STABILITY AND SENSITIVITY ARE OF IMPORTANCE.

Power Output 10 watts minimum ★ 28 MHz IF ★ Drive 1 mW to 10 mW ★ Aerial Changeover by PIN diode switch ★ Modern Microstrip Techniques ★ Power requirements 12 volt nominal at 150 mA 2.5 amp. peak ★ Case size 187 x 120 x 53 cm ★ Spare 432 input socket.

MODEL MMT432 — Price $215

MMT TRANSVERTER

TRANSVERTER MODEL 144/28

This 144 MHz Solid State Linear Transverter is intended for use with 28 MHz transceiver to produce a highly reliable transceive capability for satellite or terrestrial communication ★ Power output 10W min. ★ 28 MHz drive ★ IF at 500 mW or 5 mW ★ Receiver gain and noise, typical 30 dB and 2.5 dB ★ Internal Antenna changeover ★ Case size 187 x 120 x 53 cm ★ Power requirements 11 to 13V at 300 mA to 2.2 amp. peak ★ Spare 144 MHz input socket.

Model MMT144/28 — Price $185

All MMT TRANSVERTERS are supplied with individual factory report. All units are housed in highly durable black diecast case, circuitry is constructed on high Q fibre printed boards. High power stages are housed in separate internal compartment.

50 MHz DIGITAL FREQUENCY METER

MULTIPLEXED 6 DIGIT LED DISPLAY, CONSTANTLY UPDATED FOR CONTINUOUS FLICKER FREE DISPLAY FOR A CONSTANT FREQUENCY READING.

★ Digit height 10 mm ★ Display width 45 mm ★ Case size 111 x 60 x 27 mm ★ Frequency range 0.45 to 50 MHz ★ Sensitivity, better than 50 mV RMS over above range ★ Input connector 50 ohm BNC ★ Input Impedance 200 ohm approx. ★ Power Connector 5 pin 270° locking DIN socket (plug supplied) ★ Power requirements 11-15 volts DC at mA approx.

MODEL MMD050 — Price $130

500 MHz PRESCALER

THIS PRESCALER USES HIGH SPEED ECL TECHNOLOGY TO ACHIEVE : 10 OPERATION TO A FREQUENCY OF 500 MHz.

★ Case size 111 x 60 x 27 mm ★ Frequency range 50-500 MHz ★ Sensitivity, better than 200 mV RMS over above range ★ Input Impedance 50 ohm, BNC connector ★ Power requirements 11-15 volt DC at 100 mA approx.

MODEL MMD500P — Price $55

NEW READY-TO-OPERATE MODULES AVAILABLE IN THE SALES PROGRAM OF VHF COMMUNICATIONS

1296 MHz CONVERTER
Microstripline, Schottky diode mixer.
IF: 28-30 MHz or 144-146 MHz.
Noise figure: typ. 8.5 dB.
Overall gain 25 dB. **Price: $65.**

432 MHz CONVERTER
2 silicon pre-amplifier stages. MOSFET mixer. All UHF circuits in microstrip technology.
Noise figure: typ. 3.8 dB.
Overall gain: typ. 30 dB.
IF: 28-30 MHz or 144-146 MHz 9-15 V 30 mA. **Price: $51.**

144 MHz MOSFET CONVERTER
Noise figure: typ. 2.8 dB.
Overall gain: typ. 30 dB.
IF: 28-30 MHz, 9-15 V 20 mA.
Price: $45.

VARACTOR TRIPLER 432/1296 MHz
Max. input at 432 MHz: 24 W (FM, CW) - 12 W (AM).
Max. output at 1296 MHz: 14 W.
Price: $74.

Pack and Post $1

All modules are enclosed in black cast-aluminium cases of 13 cm by 6 cm by 3 cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via OSCAR 7 or for normal VHF/UHF communications.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ONWARDS forwarding. Please add sufficient for freight or postage, excess will be refunded.

Australian Distributors for Microwave Modules Limited:

AMATEUR ELECTRONIC IMPORTS

P.O. BOX 160, KOGARAH 2217, N.S.W. **PHONE: (02) 547 1467**

VHF-UHF
AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 5233

AMATEUR BAND BEACONS

VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
	VK2WI, Sydney	144.010
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.600
	VK4RTT, Mt. Mowbullan	144.400
VK5	VK5VF, Mt. Lofty	53.000
	VK5VF, Mt. Lofty	144.800
VK6	VK6RTV, Perth	52.300
	VK6RTU, Kalgoorlie	52.350
	VK6RTW, Albany	52.950
	VK6RTW, .Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RNT, Launceston	52.400
	VK7RTX, Devonport	144.900
	VK7RTW, Lonah	432.475
VK8	VK8VF, Darwin	52.200
3D	3D3AA, Suva, Fiji	52.500
JA	JD1YAA, Japan	50.110
HL	HL9WI, South Korea	50.110
KG6	KG6JDX, Guam	50.110
KH6	KH6EQI, Hawaii	50.104
ZL1	ZL1VHF, Auckland	145.100
ZL2	ZL2MHF, Upper Hutt	28.170
	ZL2VHP, Palmerston North	52.500
	ZL2VHF, Wellington	145.200
	ZL2VHP, Palmerston North	145.250
	ZL2VHP, Palmerston North	431.850
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

The two six metre beacons in the Antarctic area previously listed in these pages have now been removed from the listing. Talking with VKOLD recently on 20 metres I asked about the present state of the six mtre beacons down there and was advised there are none, so they have been withdrawn for the time being. I have also been advised that the Townsville beacon on 52.600, VK4RTL, is temporarily out of commission due to some TVI problems. However, as you will not read this before February, it is possible it will be in operation again by then, so the listing continues, but would ask if it is closed for an indefinite period would the custodians please advise me accordingly.

The Palmerston North beacon on 52.500 ZL2VHP has been heard on a number of occasions throughout November and December, quite often with signals to S7.

SIX METRES

Well what a DX season! Truly something like the old times with all States being available during a single day many times. As I reported last month, the good openings started a little later this year, but with the thus expected result that they would be good, and they have been. One of the more consistent signals around has been Ken YJ8KM in the New Hebrides, who has been worked in all States, with signals to S9 at times. The distance from VK5 to Ken is about the same as New Zealand, 2000 miles or 3400 km. New Zealand stations have been heard with greater regularity this year, either there are more stations keeping on the air or conditions are better looking that way. All call areas ZL1 to 4 have been worked. An interesting feature of the stations worked in the New Hebrides and New Zealand has been the signal strength, many dB over S9 at times, which is a bit rare in VK5 anyway. Most double hop transmissions run around the S7 mark due to attenuation through the second hop. This leads one to believe that the signals this year on the 2000 mile circuit have been by some mode which does not involve second hop, like extended Es. The same has applied to P29, well over S9 at times. On all these paths, however, there have been strong signals also from the intervening distances, while YJ8KM has been S9+, then so have been the VK4's, when ZL is 9+ so is VK7 and so on. However, there has been a noticeable absence of strong VK3 signals, indicating a lower overall maximum useable frequency (MUF), usually around 90 to 100 MHz for these type of openings.

Nevertheless, many tries have been made on 144 MHz to other call areas without avail under these conditions. However, on 16/12/76 conditions improved still further, the MUF rose right up to about 180 MHz for about 20 minutes in VK5 around 0000Z when the following events took place: David VK5KK copied the Ipswich repeater VK4RAI Channel 6 at S9+, and the Gold Coast repeater VK4GC at S5 which may be a private repeater. However, he could not raise anyone as they were unoccupied at the time. By this time we had John VK5ZBU and Rod VK5ZRK nosing around on 144 MHz with the result they were able to get two of the Brisbane boys who were very strong on 6 metres, to come down to 2 metres. David VK5KK worked Rod VK4ZRQ 5 x 9 and Neville VK4ZRQ 5 x 7. At this time John VK5ZBU was not hearing the VK4's, first they rose sufficiently for Rod VK5ZRK to work them at 5 x 9, and soon after John VK5ZBU the same. Finally Clem VK5GL came on and worked them. Rod VK4ZNC was using 400 watts PEP, John VK5ZBU and Clem VK5GL each 2½ watts from an IC202. Band closed 0026Z. There were no other stations around to work either way, but this is understandable due to it being a Thursday. Both David and John commented on the very selective pattern of availability of the signals, moving from one area to the next adjacent, etc. Good work, chaps, it shows what you can do when the band opens and you are there. As we usually only have one such Es type opening each year, I guess that will be it for this time. In passing, it may be of interest to advise readers that at the time of the 2 metre opening, Channel 7 TV in Adelaide did have the usual line pattern on it similar to that observed on Channel 2 more frequently, giving proof of a very rapid rise in MUF. But it didn't last long.

Excellent strength 6 metre signals have been emanating from Tony VK6BV at Kalgoorlie this year, better than ever, and Perth has also been good, again a further series of good long distance signals.

SIX METRE JOTTINGS

The following snippets of information have been taken from things heard on six metres during openings; they may be a bit jumbled but generally of the best to the VHF operator . . . P29MJ is now VK7MC . . . ZL3QK available in VK5 for more than 3 hours on 21/11 up to 5 x 9 . . . Mike VK2AM in Sydney reports SSB 2 metre activity quite high there . . . ZL1QI excellent signals with only 6 watts . . . 23/11 Jim VK5ZMJ worked ZL with only 3 watts . . . Lance VK4ZAZ long remembered for his famous AM signal worked using SSB, but AM transmitter not wrecked, merely in mothballs . . . 1/12 VK6BV and VK6XY both worked YJ8KM, signals 5 x 4 . . . later to Harry VK6ZZ . . . Peter VK6ZDY interested in 6 metre meteor scatter skeds, please contact . . . 5/12 YJ8KM into Perth again 5 x 9, that's nearly 5500 km . . . 1/12 Geoff VK8ZGF worked for first time this season . . . 10/12 reported ZL's copied VK5 Field Day stations on 6 m . . .Bob VK5ALV worked from Marree 700 km north of Adelaide, first known operator from that area . . . Ken YJ8KM reports nothing heard so far of the beacon in Suva 3D3AA . . . News came to hand of VK9ZM on Willis Island operating 53.1 and 52.525 . . . Albert VK2ZFB observed back on band with FT620.

What has been of interest this season are the large number of low powered stations operating, many with IC502's, etc. In a brief look down through my log book I note ZL1QI 6w, VK2ZAF 3w, VK7ZMM 3w, VK4ZWP 5w, VK2ZIB 2w, VK2ZAY 1w, and lowest of all Rod VK4ZRQ 50 mw! Rod's signals were 5 x 7, so that's not a bad effort. There are of course large numbers of other low power stations not necessarily documented plus the army of stations using FT620 or TS700 gear running 10 watts. All this is very fine when band conditions are good, but operators running QRP rigs to only quarter-wave whip aerials make the going tough at the other end when conditions are not optimum. How about an improvement in the antenna department you guys, say a 4 element beam — it will work wonders with your small rig, and will be heard better under poorer conditions. There is absolutely no doubt in my mind that since the advent of high power stations with large antenna systems located in good areas, we are finding 6 metres in particular is available for operation for many more hours than previously imagined, and it is still the same ops. who can be worked when there are no other signals, simply because of the improvements to the station equipmnt. There is a chronic shortage of QQEO6/40 valves for linear amplifiers these days, but readily available 30 to 40 watt transistors which make nice linears can be purchased for less than the cost of a 6/40. From the time you read this you will have 9 months to build one before regular band openings commence at the end of 1977, so why not get into it now?

Still on six metres, and that's where most people are it seems, Barry VK2ZAY enters a plea for stations to separate out more than they are doing. He says, and it's true, almost all operators crowd the first 100 kHz of 52 MHz causing unnecessary QRM, and often blotting out weaker long distance stations. He has been trying without a great deal of success when contacting stations to get them to VFO above the 100 kHz mark and so spread out. I recall years ago when we all worked using AM we would be spread over more than 500 kHz of the band, and one regularly tuned "from the band edge up" or "53 MHz down" according to our fancy. Are we, therefore, indicating to the powers that be, and perhaps more particularly, commercial interests, that we can satisfactorily get by with only a fraction of our 52 MHz allocation of 2 MHz? For my part, nowadays I enter the frequency I am operating on in the log book, e.g. 52080, rather than just stating 52 MHz. Someday it may be useful to prove other areas of the band are used by me. For extended cross band contacts of a local nature both parties go up, say, to 53 MHz on six, and perhaps 147 MHz on the 2 metre band. This is duly noted in the log. So next DX period chaps, why not let us utilise the area between 52.000 and 52.200 and then in subsequent years go a bit further? Think about it!

TWO METRES

To change the subject of bands, let's have a look at 144 MHz. Lots of things have been happening there too. You have already read about the opening between VK5 and VK4, but I have it on good repute that on 11/12 Alan VK4ZAN at 0605Z copied VK5ZNN and VK5VJ through the Adelaide Channel 8 repeater, but these stations thought he was portable in VK5. Alan was using an IC22A to a stacked pair of 5 el. yagis at 35 feet, and gave a number 51002 in the Ross Hull Contest. It is unfortunate Alan was unable to run more power, he may have made a contact then, but again indicates that even the FM repeaters can help with warnings of an opening on 146 MHz. And again on 4/12 Lance VK4ZAZ mentions hearing a Channel 5A TV station, probably Wollongong, and the VK1RTA beacon on 144.475, but despite calls no stations were worked.

There have been a number of occasions during November and December when band conditions across southern Australia have brought contacts between VK5 and VK3 and 144 MHz, to mention some, 7/12 to Ray VK3AV, Eric VK3BEH; 8/12 VK3BEH; 18/12 Keith VK5SV reported 60 dB over S9 signals from Ch. 7 repeater at Mt. William, and strong signals on the side of his beam at the same time from Ch. 8 repeater at Mildura. On 19/12 good morning opening to VK3BEH (5 x 9), VK3AIH, VK3YII and others. Ron VK3AKC also worked, while Col VK5RO added he worked 12 VK3 stations from his superior location in Adelaide.

So any of you doubters who wonder what can be done on 144 MHz, there's your answer. Col VK5RO does not have elaborate equipment, but he has a good location, with equipment which works well, and is a dedicated VHF operator who knows when to be around.

I had quite a long discussion the other night with Darrell VK3AQR, who makes a worthwhile suggestion, and one which I would like to see VHF operators give serious thought to, and if you have specific thoughts on the matter, please write to either Darrell or myself, and we will then see what becomes of the idea.

It has been suggested that an HF net be formed for operation perhaps once a week, preferably on a Monday or Tuesday night, to encourage the exchange of ideas and thoughts for the use of 144 MHz on a greater scale, to pass on information of new and impending stations, equipment in use, etc to inform those in the net and listeners

of what is being heard on 144 MHz and when, advance notice of possible good propogation conditions.

Additionally, six metre operators will be encouraged to join in any discussions, and probably those on 432 MHz, as there will be news to disseminate from both those bands. The total outcome of course is to encourage greater use of the vast amount of equipment which is currently available for use on VHF bands, and which for a great part of the year is not used. To provide a greater coverage throughout the year, it is tentatively suggested a net frequency of about 3580 plus or minus QRM. The original time suggested was 0930Z, but there are problems with this time and the proposed frequency. Firstly, 3580 would be useless for VK6 at that time, also it would be too early as that would be only 1730 local in Albany and Perth and most likely operators would hardly be home from work. To operate on an all-year-round basis on 3580 a time not earlier than 1130Z would have to be considered, which should not be too late for the likely interested operators in the eastern States, and probably conditions would not be too bad for the West. Problems again arise from the use of summer time in some areas making a further hour difference, and yet 80 metres seems the only band likely to be of use to operators listening to other stations in their own call areas. 40 metres suffers from various forms of skip distance problems. Anyway, what do you think? I would suggest a Tuesday night as being the most consistently suitable here, but then I am thinking of myself!! But it would be close enough to the week-end just passed for info. to be current. What about bands and/or frequencies. Can we cater for Z and N calls satisfactorily, e.g. cross band operation? Please think about all the above, also what about a net controller, and from which State would he be best to operate from?

MOONBOUNCE REPORT

Lyle VK2ALU through "The Propogator" reports not much return for their efforts during December. Scheduled tests with SK6AB and LX1DB on 14/11 provided no signals other than their own echoes to a max. of 7 dB above noise.

A special test requested by K3PGP was run on 27/22, and despite an extension of the period to a total of 1¼ hours, the best report they could give him was "T" copy, as his signals did not peak over 2 dB above noise. He indicated that he was copying them quite well — but then his ears must be better than those at VK2AMW. On this occasion Lyle reports their own echoes were received at approx. 45 degrees varied polarisation, thus causing 3 dB in strength to a max. of 5 dB above noise. Both test sessions were attended by VK2ALU, VK2ZEN and club member Peter Venner.

A new output audio amplifier is being made up, with modified frequency characteristics, to see what effect this has on readability of signals.

Chris VK5MC mentions having heard ZL1BJQ calling on 144 MHz EME on 8/11. No other details at this stage.

BITS AND PIECES

More further beacon news. Advice is to hand that the 432.000 MHz beacon in Brisbane will be shifting to 432.400 and will be radiating with a 6 dB gain antenna. It will be interesting to observe the coverage of this beacon and whether it will be subject to any increase in coverage with improved band conditions as noticed on 144 MHz.

Aub VK6XY advises the shifting of the Albany beacons to Mt. Adelaide, about one kilometre south of Albany. This now means the four beacons located there will now all be at the same site, namely the two amateur beacons on 52.950 and 144.500 and the two commercial beacons on 135.500 and 1700+ MHz. For those in Adelaide particularly who monitor the Albany beacons these changes will be welcome.

Aub mentions also that Bernie VK6KJ is now on 432 MHz, and hopes soon to be on 1296. Wally VK6WG is now on 1296. Bob VK6BE is now operational on 52, 144 and 432 MHz. It is to be hoped enough of the Adelaide boys sitting in prime positions near the shoreline will be doing something positive to provide the other end of the path. 1296 to Albany appears now to be only a matter of time. Ron VK3AKC no doubt will be watching the situation with interest.

On 11/12 I observed at my QTH at 0400Z a sharp rise in noise on six metres, and on investigating I noted a number of strange JA signals on 28 MHz. Looking down at the 50 MHz end of the band I heard a lot of TV rubbish with sundry carriers between 50.3 and 50.8 MHz around S4. A steady carrier was noted at S3 on 50.110, but no ident. All was quiet again by 0424, so a possible opening to JA didn't quite make it.

It has been noted with much interest that throughout the excellent 6 metre openings we have been getting this year, that quite a large degree of backscatter signals are here and being worked, and it does appear to be more prevalent when long haul DX is operating. For those new to the game backscatter signals are usually weak (around S1 to 4), can be fluttery and usually have a hollow or echoing sound. They are generally perfectly readable though, and many contacts are made by this method. They will be heard from, say, VK4 when you may have your antenna on VK6 as an example, and you can prove the situation by turning your antenna in the direction of the station you are hearing and the signal will disappear. Quite an interesting form of contact.

John VK5ZBU has written with some observations he has made on VHF this year. He mentions the extremely good conditions prevailing on 21/11 when ZL signals were so good, and goes on to give support to what I have already said about these transmissions being other than double hop due to their extreme strength. John is equally interested in the large number of very strong signals, particularly from VK1, 3 and 6. I must agree with him in regard to VK6 anyway, I can never recall hearing signals from there so strongly as this year.

John adds further strength to the plea for us to spread out further on the six metre band. He wonders just how it is possible for stations in ZL, P29 and YJ8 to effectively work VK stations when all are cluttered together in less than 100 kHz, and with so many calling whilst these stations are in QSO with others. On this point it does seem evident from many observations that stations in some States are calling these long distance stations on spec, without actually hearing them. How else can one explain why they continue to call say YJ8KM when he is already in QSO with another station in another State?

On the matter of long haul DX John speaks of activity on 10/12 when ZL3QK worked Garry P29GR, Graham VK8ZCQ in Darwin, VK6BV Tony in Kalgoorlie. That's certainly spreading the signals around! VK7MC and VK7JV worked VK8ZCJ, while VK7MC also worked VK5ZBH, the newcomer at Ceduna, who has virtually filled the vacuum left by Kerry K5SU when he was transferred to Moree, N.S.W.

I guess that's about where I had better stop. It has taken a long time to prepare these notes this time with so much info. to be sifted and placed in some sort of order. In the next issue I will present a summary of observations covering the overall VHF activity for the early summer period of operation.

Closing with the thought for the month: "February is when millions of bright, shining, happy, laughing faces turn towards school. They belong to mothers."

73. The Voice in the Hills. ■

INTRUDER WATCH

Alf Chandler, VK3LC
1536 High Street, Glen Iris, 3146

It is interesting to read a Memo issued by ARRL, and I quote — "The Intruder Watch program has been publicized recently in the form of a W1AW Official Bulletin and the response has been fantastic. We've already added about fifty new IWers to the program so far, and many of them are already on the active list." Unquote. If they can do this in the US it behoves us to act in a similar way, don't you think?

More Observers are needed in all States. More information is also of interest to us in Region 3, and I quote again — "Since late June, Treaty action has been taken on the following cases: 7050 Cairo A3; 7060 Peking A3; 7065 Tirana A3; 7075 Cairo A3; 7080 Peking A3; 7072 transmitting the latter 'Q' A1, near Moscow; 14208 and 14080 F1, near Moscow. This does not mean that reports on these should stop coming in! If a station does not cease interfering after receipt of a formal complaint, then we intend to continue complaining, and initiating periodic Treaty action, and this will result in a collection of evidence which will be instrumental at the 1979 WARC." Unquote.

This applies equally to our Administration, and complaints are being forwarded to countries allowing intruders to transmit in our bands. A case in point is the Japanese fishing boats operating in Australian waters on frequencies in the 3.5 MHz band, and also to the pulse signal heard on all frequencies from time to time. This pulse, as you know, is on all HF frequencies at different times and causes interference to all Services using the high Frequencies. I was interviewed recently by VK3LX for the ABC program "Club Forum" with regard to that same subject. They had received letters from their listeners complaining of the interference.

Referring to pulse transmissions, yet another one has been heard in the 21 MHz band. Whereas the one mentioned above has been measured here at my QTH and transmits 27 pulses per second, this one is slower at 5 pulses per second, but just as loud and from the same direction. It is a wide band pulse, and seems to sit on a frequency for some time before moving. More reports on this one would be appreciated. ■

WICEN

Emergency communications were set up and operated by radio amateurs in the Hornsby area on 3rd to 5th December last during severe bushfires.

In a note, Tony VK2BTL, said the President of the newly formed Hornsby and District AR Club, Barry VK2AAB, contacted the local SES offering assistance.

The offer was accepted. Control centre was sited in the Hornsby Shire Council chambers. A call was put out for amateurs with mobile equipment. The response was excellent. Some moved to trouble spots with fire fighters, some went to remoter places and others operated as spotters. The club call VK2APF became net control.

The activities lasted over 30 hours so shifts had to be arranged. Assistance was given by the NSW Division and the VK2 WICEN organisation. The Ch. 8 Dural repeater and simplex channel 50 were used for the emergency traffic communications.

Towards sunset on the 4th there was a total power failure in the area and for some 15 minutes the amateur nets were the only means of communication. Heavy pressure on the telephones meant that additional channels were essential. Some 60 to 70 amateurs assisted and many others volunteered but were not required.

Further amateurs were put on standby, with fires at the same time in the Blue Mountains, when the police activated WICEN in that area. Fortunately these fires were brought under control reasonably quickly. ■

AR AWARDS

The Publications Committee have pleasure in advising the following awards granted for the year 1976 —

HIGGINBOTHAM AWARD:
Mr. Maurie Evered VK3AVO.

[NOTE. The Committee recorded appreciation for the work of Mr. Ron Fisher VK3OM for AR but regretted inability to grant this Award to him because of his membership of the Committee.]

TECHNICAL AWARD:
Mr. R. A. J. Reynolds VK3AAR for his Linear Amplifier articles in the issues of April, May and June.

ASJA:
Mr. B. J. Morgan VK7RR for his repeater article in September.

1977 SUBSCRIPTIONS REMINDER

Final Notices cost the Institute time and money to mail out to unfinancials.

Please help by paying your subscription in good time.

AR is cut off automatically to unfinancials after a short period of grace. It may not be possible at a later date to send missing issues because of copies becoming out of print. ■

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

Barlow Wadley Model XCR30 Mk II. Excellent condition, $165. Ph. (03) 528 4444, ext 228 afternoons and evenings.

AR8 Rx covers 140 kHz 20 MHz HF section fully modified, noval valves, noise limiter, etc., circuit, AC power supply, suitable for use with any VHF converter, suit SWL or novice licence, taking up space, no reasonable offer refused. VK3ZMR, QTHR. Ph. (03) 306 7536.

AWA car phone, low band, complete $30; VHF test set, brand new, $35; HF wavemeter, suitable as sig, gen., $25; crystal calibrator, etc. Prof. G. R. Felser VK2ZGF. Ph. (02) 221 1655 bus. or 487 1353 weekend.

Cushcraft 5 el. heavy duty beam for 6 m; perfect condition, $45. L30134. Ph. (03) 467 2131 bus.

Mosley TR33 trap ant., old but useful, $20. 12 FG rod blanks, 12 ft long ¾ in. taper to 3/16 in. plus Alum angle centres. Go Quad or fishing, $75. Would be interested to buy hand Ken. VK2AEM QTHR.

Collins KWM2 Transceiver S/N 36461, four years old with 516F-2 AC power supply, Collins MM1 dynamic mic and manual, $700. Yaesu FL2000B linear (572B's), $300. Both mint condition. VK4YM, QTHR. Ph. (075) 31 7830.

Swan MB40A Transceiver and Microphone, as new, 12V DC, 160 Watts PEP, fully solid state, 3 in. x 8 in. x 9 in, $250. VK4NB, QTHR. Ph. (07) 349 4615.

2 Selsen Motors, new cond., never used, pair $15. Tranpro VCT with additional socket board for mod. tubes, operates on AC or 6V DC, $35. H.T. transformers, 1500/1500 at 300 mA, plus many others, also new and used valves. Send SASE for lists and prices. HV 4 mFd and 2mFd conds. VK2DA, QTHR. Ph. (02) 94 1039.

FRDX 400 Transceiver, good condition, $325. VK2AAC, 20 Timaru St., Kirrawee 2232. Ph. (02) 521 7080.

Oscilloscope, solid state lab. instrument, Fairchild type 766H with 50 MHz dual trace and delayed sweep plug-ins, very good condition, complete with leads, probes, set of manuals, $650. VK2HS, 23 Brisbane Street, Bondi Junction 2022. Ph. (02) 387 2492.

Power supplies, power and audio trans., magazines, mobile whips, 5BPI tube, variable condensors, morse records, various components, odd chassis, etc. Send SAE for list or Ph. (03) 546 3940 A.H. Jeff Silvester L30409, 9 Goodwood Drive, Springvale, Vic. 3171.

IC22 2 m FM 10W mobile, fitted for repeaters 2-8, reverse 2-8, simplex 37, 40, 43, 49, 50, 51, with mic., manual, all cables, brackets, etc., $165 ONO; IC2020 2 m SSB, portable, as new, with crystals for 144.00-144.60, plus Oscar, with mic., manual, all cables, etc., $135 ONO; Siewa MR-2 pocket sized VHF monitor Rx, 12 channel, fitted for VK3 police and CFA, with nicad battery and charger, $55 ONO. Ray VK1ZJR, 19 Gungurra Cres., Rivett, A.C.T. 2611. Ph. (062) 88 5624.

IC202, only three months old in as new condition, complete with all original extras, packing case, mike and case plugs, etc., English instruction manual and Vicom warranty, 144 to 145 MHz crystals fitted plus Oscar crystal 145.5 MHz, $150. VK8IG, QTHR.

Genave 25W 2m 10 ch. mobile transceiver with xtals for repeater, new, $275; 60 ft tubular steel tilt over mast, will take rotating beam, new, $300; Kenwood TS500 80-10 transceiver, had little use, $375. G. Down, 3 Broome Street, Katanning 6317. Ph. 21 1457 (bus.).

ICOM 21A, base/mobile FM 2m transceiver, includes xtals for 11 channels, as new, only $210. Ph. (03) 467 2131.

From estate of the late J. Georgeson VK2AKU: Hallicrafter Tx HT37, $150; Hallicrafter Rx SX100, $125; Ferguson transformer 240/115V 750VA, for sale with the above equipment, $65; 30 ft. free standing steel tower, with prop pitch motor, selsyns, and their power supplies; purchaser to arrange dismantling and removal, $250. VK2AJL, QTHR. Ph. (02) 41 7729.

Kirk Super Quad, 2 el. 14, 21 and 28 MHz, fibreglass spreaders, new and unused, complete with all wiring, instruction book, etc., not able to use because change of QTH in new year, $200. VK3OC, QTHR. Ph. (03) 29 4260.

WANTED

Still looking for Vintage Morse Keys and pre-WWII parts and gear. Any type, condition, will buy or swap. VKSS, QTHR.

Illustrator needed for simple humorous pen sketches on AR subjects. If anyone can help please write VK4SS, QTHR.

FV50 VFO for FT75B; also manual or photo copy of manual for FT75B and AC and DC P/S. Notify details including price to Ray VK1ZJR, 19 Gungurra Cres., Rivett, A.C.T. 2611, or phone (062) 88 5624 (A.H.).

Antenna coil for the Rx section of a vane spindler SR5-2 marine transceiver. Details Michael, 80 Edithvale Road, Edithvale, Vic. 3196. Ph. 772 3175 (A.H.).

Any information re circuit, operation or connections of APX6 radar transceiver. VK5RI, QTHR.

Steam engine and generator to power type 3 Mk 2 transceiver. Also wanted airborne radar systems, scanners, CRO indicators, duplexers, test sets, harnesses, handbooks, i.e. A276, H2S, APS3, APS4, APS13, Rebecca, Eureka, type 717. Details to W. Babb VK3AQB. Ph. (03) 337 4902.

Wanted urgently by Volunteer Bush Fire Brigade. Your surplus and working hi-band carphone (Pye overland for preference as the mobile mount is already on fire trucks), plus handbook or schematic for photocopy. Limited funds but your expenses happily paid. Don't delay, the fire danger will be high for some months. Please write or despatch today to Les Kinch VK2BBD, c/- Bush Fire Brigade HQ, Terry Hills, NSW 2084.

Urgently need to keep communications going during high bush fire danger period. Handbooks/schematics for Pye overland, AWA carphone, vinten, etc. All high-band models. Can photocopy if needed and return. Please don't delay. Contact or despatch today. Expenses paid and all letters acknowledged. Les Kinch VK2BBD, c/- Bush Fire Brigade HQ, Terry Hills, NSW 2084.

Speaker Transformer, 10,000 ohm, primary CT, 3.7, 8 or 15 ohm secondary. Colin Gracie, Cavendish P.O. 3408. Ph. (055) 74 5211.

RT181/APG30, complete or incomplete. Replies to D. A. Page, 76 Castlereagh Street, Penrith 2750, or ph. (047) 31-1311, ext 726 (bus.) or (047) 21 8102 (A.H.).

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. IVOR MORGAN	VK3DH
Mr. L. J. SALTER	VK4XS
Mr. R. J. EVERINGHAM	VK6BO
Mr. H. S. DOWNIE	L60250
Mr. W. J. HARWOOD	VK5ZD
Mr. STANLEY H. MILLIGAN	ex-VK3AU

ROLAND JOHN EVERINGHAM VK6BO

Rolo Everingham VK6BO died suddenly on Tuesday, 9 November, 1976. His death is a great loss to amateur radio and especially VHF in Western Australia. Rolo became involved in VHF in the late 1940s. It was he who made the memorable contacts on 144 MHz to VK5GL and VK5QR in Adelaide from Perth in 1951 and 1952 respectively. The Adelaide/Perth path has not been re-established since that time despite increased power and activity at both ends. Rolo remained keen on 144 MHz and could generally be heard using MCW on 144.22 MHz during 6 metre openings to the Eastern States.

He was active on 6 metres and is the only Western Australian to have ever won the Ross Hull VHF Contest Trophy.

Not content with 6 and 2 metres, Rolo built one of the first crystalled controlled transmitters on 288 MHz and held the WA record for that band until it was withdrawn. He was active on 432 MHz and made many contacts through Oscar satellites.

His tenacity with VHF experimentation and propogation was evidenced by his early morning (06.45) skeds with Wally Green VK6WG. These persisted over many years and established that the 400 km path to Albany could be worked virtually every day at that hour. The same pair had less success over the Norseman/Perth path but the presence of these signals served as a benchmark for other amateurs who participated from time to time in these tests.

Rolo fostered young people interested in amateur radio. Much of the impetus for the early Z call holders came from Rolo's quiet assistance — both to gain a callsign and then to use it. He was able to help solve the technical problems of VHF in a period when TV components and 2-way mobile radio were not in existence in Australia.

Rolo was a founder of the WA VHF Group Inc. and was one of the six signatories to the letter widely circulated seeking retention of the 50-54 MHz band when the introduction of TV had shifted the 6 metre band to 56-60 MHz.

In his professional life Rolo was the Principal of the Mount Lawley Technical College before retirement. This College was the major institution for trade, Certificate and Diploma teaching in Electrical and Electronic Engineering and for TV servicing production and transmission. Hence in an amateur and a professional sense Rolo Everingham made an outstanding contribution to electronics in Western Australia.

He is sorely missed.

W. J. House, President
W.A. VHF Group (Inc.)

EXCHANGE

Swap two 4-125A tubes (list price $63.90 ea.) for four 6JS6 tubes (list price $8.25 ea.). VK8RR, QTHR. Ph. (089) 81 2558 A.H.

Anyone interested in used stamps? Cleaning out an accumulation of over 40 years, loose and on covers, Australian and foreign from all over, several boot boxes. will make swaps for any pieces early wireless gear in any condition. VK4SS, QTHR.

☆

The Wireless Institute of Australia

serves the interest of all Licensed Amateur Radio Operators.

☆

IT IS TO YOUR BENEFIT, IN THE CONTINUATION OF YOUR HOBBY, TO OBTAIN AS MANY NEW MEMBERS AS POSSIBLE TO ENABLE THE WIRELESS INSTITUTE TO PRESENT AN OVERALL UNITED FRONT IN THE PROTECTION OF OUR VALUABLE FREQUENCY.

☆

Your Support is earnestly requested and the time to act is NOW.

☆

Advertisement

MAGPUBS

Members interested in overseas publications should please note constant changes in prices which are of course also affected by exchange rates. Overseas magazines are always posted direct to you from suppliers, so please allow about 3 months for transit delays.

$A.	1 yr.	2 yrs.	3 yrs.
QST	9.80	19.60	29.40
73	10.00	—	19.40
CQ	8.00	13.80	—
Ham Radio	12.00	—	30.50
Radio Communication*	12.30	—	—
CQ-TV*	4.50	—	—
Break-In	7.00	—	—
VHF Communications	6.00 (Air Mail 8.00)		

*Please ask for membership form beforehand.

- **BACK ISSUES** of VHF Communications are normally available from stock except 1969 issues which are out of print. Single copies are $1.10 each to 1974 and $1.40 each from 1975 (average weight of each is 90g); VHF Communications binders to take 12 issues are $2.25 each and weigh 250g.
- **BACK ISSUES** of other magazines are not available but sometimes can be obtained against special order.
- **BACK ISSUES** of Amateur Radio are available to members. Some issues are out of print however. Issues March to May 1972 at 30c each, June '73 to Dec '74 at 40c each, Jan-Oct '74 at 50c each, Nov 74-Aug '75 at 70c each, Sept '75 onwards at 90c each. Calculate average weight as 120g per issue.
- **AMATEUR RADIO** is available on overseas subscription at $10.80 for 1977. It is also available at this rate for libraries and organisations such as Government Departments, Schools, etc. All these are post paid by surface mail.
  For overseas subscriptions, please enquire about extra cost for air mail. As an indication of rates — extra for Air Mail to PNG is $10.00 for a full year.
- **YRCS NOTES** are also available on request.
- Recruiting leaflets "8000" are supplied free of charge.
- **OTHER ITEMS** are also normally available from stock. These include —
  - Membership Badges (specify full or associate, lapel or stick-pin) $1.50*
  - Terylene ties, blue or maroon $2.90*
  - WIA Project Australis Great Circle Maps (on Melbourne) $1.00*
  - Overseas DX & USA Call Books, NZART Call Books, and many, many other interesting items — **please send for lists.**

  *Post Paid.

Except for magazine subscriptions all other items are normally available from **YOUR DIVISION.** To save on postages and packing, it is better to enquire there first if you live in capital cities.

Always please add extra for postage and packing except on current magazine subscriptions or where prices are stated as including postage.

MAGPUBS

A WIA MEMBERSHIP SERVICE

P.O. BOX 150, TOORAK, VIC. 3142

NOW is the time to order YOUR

'77 callbook

Don't wait until 1977 is half over. Get your new **Callbooks** now and have a full year of the most up-to-date QSL information available anywhere.

The new 1977 **U. S. Callbook** has over 300,000 W & K listings. It has calls, license classes, names and addresses plus the many valuable back-up charts and references you have come to expect from the **Callbook.**

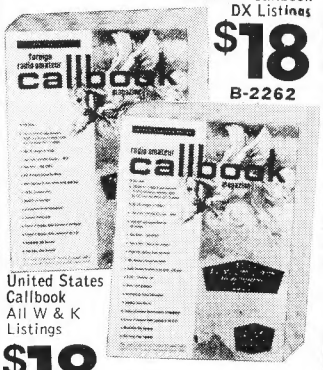
Specialize in DX? Then you're looking for the new, larger than ever 1976 **Foreign Callbook** with over 263,000 calls, names and addresses of amateurs outside of the USA.

At Dick's FIVE Famous Electronics Stores NOW !

Foreign Radio Amateur Callbook DX Listings

$18

B-2262



United States Callbook All W & K Listings

$18

B-2260

Send $1.50 per Order for Packing & Postage

DICK SMITH ELECTRONICS CENTRE

Gore Hill — 162 Pacific Hwy, 439 5311
Sydney — 125 York St, 29 1126
Bankstown — 361 Hume Hwy, 709 6600
QLD — 166 Logan Rd, Buranda, 391 6233
VIC — 656 Bridge St, Richmond, 42 1614
Send you Mail Orders to:
P.O. Box 747 Crows Nest, N.S.W. 2065

GO MOBILE HF MOBILE ANTENNAS

HUSTLER MOBILE ANTENNAS
Quality Hustler Resonators, precision wound with optimum design for each band, adjustable rod for lowest vswr:

RM80 (80 metres)	$26	RM20 (20 metres)	$22
RM40 (40 metres)	$25	RM15 (15 metres)	$22
RM10 (10 metres)	$22	RM11 (11 metres)	$19
MO2 Mast for above	$26	RSS-2 Spring	$11.50
BM-1 Bumper Mount	$19		

MARK HELICAL WHIPS
Quality 6' Heliwhips providing 50 ohm match at resonant frequency:
HW20 (20 metres) Resonant freq 14.2MHz, bandwidth 250KHz $31
HW40 (40 metres) Resonant freq 7.07MHz, bandwidth 100KHz $31
HW80 (80 metres) Resonant freq 3.60HMz, bandwidth 50KHz $31
Chrome plated spring base Model LDS $13
Moulded base mount $17.50

2M ANTENNAS

NEW JAYBEAM ANTENNAS
2 METRES

5Y/2M 5el, 7.8dBd, 1Kw peak	$26
8Y/2M 8el, 9.5dBd, 1Kw peak	$29
10Y/2M 10el, 11.4dBd, 1Kw peak	$57
10XY/2M 10el crossed yagi, 11.3dBd	$66

NEW

70cm

D8/70 twin 8el, 12.3dBd, 1Kw	$46
PBM18/70 18el, 14.9dBd, 1Kw	$57
MBM48/70 48el, 15.7dBd, 1Kw	$55
MBM88/70 88el, 18.5dBd, 1Kw	$66

MISC

RINGO RANGER ARX-2	$45
Lindenow 5/8 2m mobile whip	$26

ASAHI
AS210BN twin 2m 10el,18dB gain, F/B 20dB, boom length 4m $119
AS210AN 2m 10el single boom 11.5dB gain, F/B 20 dB $ 54

RAK ANTENNA

RAK TRAP DIPOLES

AL48DXN (40/80 metres)	$47
AL24DXN (20/40 metres)	$45
MIDY IIN (80/40/20m)	$48
MIDY IIIN (40 thru 10M)	$48
MIDY VN (80 thru 10m)	$58

Midy-V N

RECEIVERS FOR THE SERIOUS SWL! * *

Yes, the famous Barlow Wadley general coverage receiver with crystal controlled reception of am/lsb/usb/cw now includes the Australian FM band!
BARLOW WADLEY
STANDARD $269 + P&P
WITH FM $298 + P&P

The new Yaesu FRG-7 general coverage receiver features ac/dc operation and the famous Wadley Loop principle with spin tuning and phase-locked synthesiser providing complete coverage from 500 KHz to 30 MHz with an accuracy better than 5 KHz. Please write for further technical details (enclosing SAE)
OUR PRICE **$325** + P&P

ANTENNAS

Listener 1 "V" type antenna. Covers 3-30 MHz with special trap. Ideal for DX reception. **$21** + P&P
Listener 3 Long Range wire dipole antenna 3-30 MHz complete with balun, feed wax, VHF plugs, insulators. Ideal for the serious SWL **$42** plus P&P

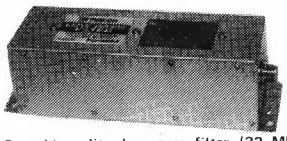
COUPLERS DAWA

CL66 500w pep, 3.5 thru 29MHz, input imedance 50-70 ohms, output impedance 10-600 ohms unbalanced. Includes 4 position coaxial switch. $139
CL65 500w pep, 2.5 thru 29MHz, input impedance 50-70 ohms, output impedance 10-600 ohms unbalanced. $128
CSW216, includes quality swr/pwr meter which operates up to 150MHz. The coupler cover 3.5 thru 28 MHz at 500w pep. $210
CL99 for two meters. Max power 200 pep, output 10-200 ohms unbalanced. $59

BALUNS

BL 50A quality heavy duty dipole type, 4 Kw pep, 2 KW am, 1.8 thru 38 MHz, 52 ohms, vswr better than 1.2 at 30 HMz. Housed in sealed cycolac which will withstand 250 Kg tension. Price $22. BL70A (72 ohm model) $24.
BN86 (Hy-Gain) for beams. Covers 3-30 MHz handles up to 1 Kw dc. Negligible insertion and feed-thru loss. VSWR 1:1 when terminated into 50 ohm load.
ASBL (ASAHI) for beams, 3-30 MHz, max 1 Kw. $26

LOW PASS FILTER



TVI FILTER
$20

Superb quality low pass filter (32 MHz cutoff) for transmitters 1.8 to 30 MHz. Insertion loss under 0.5 dB, input/output impedance 50 ohms. Copper construction with SO 239 sockets. Will handle 200w pep (max). $20 + P&P
1KW pep model (0.3 dB insertion loss) $35 + P&P

SWR/PWR METER

POPULAR VC2 SWR/PWR METER
The popular VC2 covers 3-150 MHz with power measurement 12/120 watts. Will handle up to 1000w. 50 ohms impedance, twin meters. This quality tru-line instrument is ideal for the shack or for permanent mobile installation. $36 + P&P
$ 36

The new Oskerblock SWR200B Deluxe is a professional SWR bridge using the thru-line principle, covers 3-200 MHz, 52/75 ohms. Each unit individually calibrated. Four power ranges: 2, 20, 200, 2000 watts.

NEW OSKERBLOCK DELUXE

HI-MOUND

1. ECONOMY KEY, chromium plated parts with a steamlined transparent cover. Hard silver contacts $17
2. QUALITY KEY, smart appearance, chronium plated keying mechanism, spring adjustment $19
3. HEAVY DUTY DELUXE KEY, fully adjustable, ball bearing shaft, plastic protective cover $32
4. MANIPULATOR (Side swiper) for an electronic keyer. Accurate and restful keying operation assuring owing to heavy metal plate and frictional rubber belt beneath the periphery of the main base $36

CONVERTERS QM70

Utilising modern technological design features and built to demanding specifications, this range of Converters has been produced to meet the increasing requirements of High Performance Equipment.

144/28 CONVERTER
- 116MHz Crystal Oscillator: Maximum Frequency Error 1 khz
- Mosfet RF Amplifier Inductively Coupled to Mosfet Mixer
- All Signal Path Inductors utilise Printed Stripline for long term performance stability.
- Gain = 28 db (typical)
- Noise Figure = 2.5db (typical)
- Power Requirements 12V DC Negative Earth @ 16mA (typical)
- I.F. = 28-30 MHz
- Aerial and I.F. Sockets both BNC as Standard

$45

432/28 CONVERTER
- 101MHz Crystal Oscillator; Maximum Frequency Error 1 KHz
- Two R.F. Amplifier Stages in cascade using Printed Stripline tuned circuits before AND after each Stage.
- Dual Gate Mosfet Mixer for excellent cross modulation immunity
- Gain = 30 db (typical)
- Noise Figure = 3.5 db (typical)
- Power Requirements 12V DC Negative Earth @ 35 mA (typical)
- I.F. = 28-30 MHz
- Aerial and I.F. Sockets both BNC as Standard

$49

1296/28 CONVERTER
- 105.66 MHz Crystal Oscillator
- Hybrid Ring Mixer utilising Schottky Diodes
- Dual Gate Mosfet I.F. Head Amplifier
- All UHF/SHF Tuned Circuits use Printed Striplines
- Gain = 25 db overall
- Noise Figure = 8db (typical)
- 12V DC Negative Earth
- I.F. = 28-30 MHz
- Aerial and I.F. Sockets both B.N.C. as Standard

$59.90

All Units housed in attractively finished and sturdy Die-Cast Boxes

LINEAR FOR TWO $119 *

All solid state 70w pep (ssb) output linear amplifier (for 14w pep input), 12 vdc operation and internal automatic RF sensing switch means that you only need to connect this unit in your 2m antenna line together with a source of 12 vdc for 10w pep OUTPUT. Accepts ssb, fm, am, or cw with switchable hang time for ssb and cw operation. Supplied complete with dc power cord and fitted with SO239 sockets.

TRANSVERTERS 2M High Power *

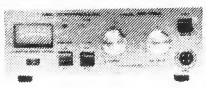
28/144 HIGH POWER TRANSVERTER. A 10 m to 2m hybrid transverter offering up to 200w pep input. Excellent FET receive converter with two IF outputs fitted as standard. Master oscillator is doubly stablilised and the pa section is well ventilated. Takes all drive and switching from your 10m rig. Built-in antenna change-over relay, metering and power on warning neon. Complete with harness and plugs for connection to your 10m rig.

* $225

2M/432 FM Transverter
This small unit obviates the need for the expense of a second transceiver or the complexity of numerous add on units with multiple connecting leads. By simply inserting the unit in the antenna lead of your 2m fm transceiver you are ready to transmit and receive on either 2m or 70cm AT THE FLICK OF A SWITCH! The unit has its own 70 cm to 2m receiver converter built in and all switching is carried out within the unit. Size 105 mm x 40 mm x 180 mm. Supplied complete with power cord and mobile mounting bracket.

* $125

Mic Compressors



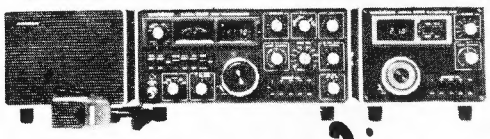
for those extra "s" points
$65

Model MC33A ac/dc includes two tone generator and built-in compression level meter. Handles low and high impedance mics with distortion better than 0.5%. Compression level -3 dB to -35 dB. $65 + P&P
Model MC22 as above (excl compression level meter) $54 + P&P

VICOM

Still the best value !

HF PLL Transceiver



More expensive than an FT101E ? New uniden 2020 Mark II

Featuring a number of circuit improvements as a result of a year in the field, the fabulous "2020" PLL transceiver offers separate usb/lsb/cw 8-pole filters as STANDARD and 6146B's in the final with screen grid voltage stabilisation for minimum distortion products. Features pcb's and even the front panel can be swung out for easy servicing. A comprehensive range of spare parts is available together with back-up service support. Overseas this rig sells for at least $65 more than the FT101E! Compare the features of the UNIDEN 2020 with other HF transceivers and you'll be quickly convinced that it offers the best value!

Uniden 2020, complete	$772
Digital VFO	$145
Matching speaker	$ 46

Vicom for technical support

13.8V DC POWER SUPPLY

This is a fully regulated supply with an output of 13.8 vdc at 3 amps (5A peak). Includes an on-off switch and neon indicator and comes complete with mains flex and 3 pin plug. Ideal as a bench supply or for powering transceivers.

$22 CS-201

CS201 quality 2 position coax switch. Will handle up to 2.5Kw pep. 50 ohms impedance with insertion loss better than 0.2 dB. VSWR better than 1.2 up to 1 GHz. Position not selected is automatically grounded.

ICOM IC202

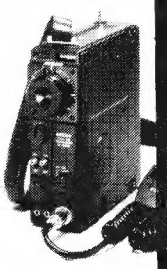
The famous IC202 handy portable runs 3w pep with VXO control 144-146 MHz. Comes complete with mic, carrystrap, dry cells, English manual and VICOM 90 day warranty.

$219

This is ICOM's first FM portable and it puts good times on the go. Change vehicles, walk thru the park, climb a hill, laze on the beach, the ICOM quality FM communications go right along with you. Long lasting internal batteries make portable FM really portable while accessible features make connection to external power fast and easy.

IC215 FM PORTABLE

$199



- Fully collapsible antenna
- 15 channels (12 on dial and 3 priority)
- Dual power - 3 watts high/400 mW low, nominal
- Lighted dial and meter
- 36 transistor, 3 FET, 2 IC, 51 diodes
- super sensitive receiver
- Crystal specifications identical to IC22a

Your new IC215 comes supplied with 3 popular channels (2, 8, 50), handheld mic with protective case, shoulder strap, connectors for external power and speaker, 9 long-life C batteries, English manual and VICOM 90 day warranty.

VICOM

DIRECTION: Russell Kelly, VK3NT
Peter Williams, VK31Z

Head Office & mail orders . . .
139 Auburn Rd, Auburn, Vic. 3123 Ph: (03) 82-5398
Sydney
23 Whiting St, Artarmon, NSW 2064 Ph: (02) 439-1271

DEALERS:

Perth:	Netronics, 388 Huntriss Ave., Woodlands Phone 46 3232
Adelaide:	Graham Stallard, 27 White Ave, Lockleys Phone 43 7981
Canberra:	Daicom Electronics, 29 Colbee Court Phillip Phone 82 3581
Brisbane:	Elite Electronics, 69 Wardell St Dorrington, Phone 38 4480

Prices include Sales Tax but exlude freight and insurance. For insurance allow $1 per $100, minimum $1. Freight sent Kwikasair (freight "collect") unless otherwise specified. Prices and specifications are subject to change without notice.